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INSTITUTE OF MANAGEMENT AND TECHNOLOGY

INTERNATIONAL CONFERENCE PROCEEDINGS

International Conference

"Energize the Future: Shaping Sustainable Solutions for Climate Resilience

(ICEF – SSSCR 2025)"

Organized by the

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at

Mangalmay Institute of Management and Technology, Greater Noida

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INTERNATIONAL CONFERENCE

ON

"ENERGIZE THE FUTURE: SHAPING SUSTAINABLE SOLUTIONS

FOR CLIMATE RESILIENCE (ICEF – SSSCR 2025)"

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Dr. Atul Mangal

Chairman, MGI

Message from the Chairman

On behalf of the organizing committee for the International Conference on "Energize the Future: Shaping Sustainable Solutions for Climate Resilience (ICEF – SSSCR 2025)", I extend my heartfelt congratulations to all the delegates for being part of this pivotal event at Mangalmay Institute of Management and Technology, Greater Noida.

It is often said that "the seeds of resilience are sown in the collective pursuit of sustainable solutions." This conference is a testament to our shared commitment to addressing the pressing challenges of climate resilience and shaping a future grounded in sustainability.

We are privileged to have the participation of distinguished experts, scholars, and professionals whose collective expertise and vision will inspire insightful discussions and innovative strategies. Your contributions will play a vital role in advancing the global agenda for climate resilience and sustainability.

It is our earnest hope that this conference serves as a vibrant platform for fostering meaningful collaborations, exchanging transformative ideas, and catalyzing actionable solutions for a resilient and sustainable future. Together, let us energize the future and make a lasting impact.

With best wishes,

Dr. Atul Mangal

Chairman, Mangalmay Group of Institutions

Dr. Aayush Mangal

Vice Chairman, MGI

Message from the Vice Chairman

On behalf of the organizing committee for the International Conference on "Energize the Future: Shaping Sustainable Solutions for Climate Resilience (ICEF – SSSCR 2025)", I am delighted to welcome all participants to this prestigious event at Mangalmay Institute of Management and Technology, Greater Noida.

As we unite to explore the pressing challenges of climate resilience, we recognize the critical need for sustainable solutions to address the environmental, social, and economic dimensions of our future. This conference is a testament to our shared vision of fostering innovation, knowledge exchange, and meaningful dialogue on this global imperative.

I extend my deepest gratitude to the esteemed speakers, delegates, and participants for their invaluable contributions to this platform. Your expertise, perspectives, and active engagement will undoubtedly enrich the discussions and inspire actionable outcomes.

It is my hope that this conference not only enhances our understanding of climate resilience but also serves as a catalyst for forging enduring collaborations and driving impactful initiatives towards a sustainable future.

With warm regards,

Dr. Aayush Mangal

Vice Chairman, Mangalmay Group of Institutions

Dr. Prerna Mangal

Executive Director, MGI

Message from the Executive Director

On behalf of the organizing committee for the International Conference on "Energize the Future: Shaping Sustainable Solutions for Climate Resilience (ICEF – SSSCR 2025)", I take immense pleasure in welcoming all participants to this distinguished event at Mangalmay Institute of Management and Technology, Greater Noida.

Addressing climate resilience is not just an environmental necessity but a critical pathway to ensuring sustainable development for future generations. This conference provides a unique platform for thought leaders, scholars, and professionals to exchange ideas, share insights, and spark innovation in this vital field.

I am profoundly grateful for the presence of our esteemed experts and delegates, whose contributions will undoubtedly enrich the discussions and drive the success of this initiative. Your active participation is essential as we collectively strive to build strategies and solutions that resonate globally and foster impactful change.

May this conference pave the way for transformative collaborations and innovative approaches that energize the future and strengthen climate resilience worldwide.

With best regards,

Dr. Prerna Mangal

Executive Director, Mangalmay Group of Institutions

Dr. Meenakshi Sharma

Dean, MIMT

Message from the Dean

It is my privilege to extend a warm welcome to all participants on behalf of the organizing committee for the International Conference on "Energize the Future: Shaping Sustainable Solutions for Climate Resilience (ICEF – SSSCR 2025)" at Mangalmay Institute of Management and Technology, Greater Noida.

Climate resilience is a cornerstone of sustainable development, offering a path to mitigate challenges and create opportunities for a more secure and sustainable future. This conference serves as a platform to engage in meaningful discussions, exchange transformative ideas, and collaborate toward a shared vision of resilience and sustainability.

I am deeply grateful to the esteemed speakers, delegates, and participants for their dedication to this critical cause. Your expertise and insights will undoubtedly elevate the discourse and inspire actionable outcomes.

Let us use this occasion to foster dialogue, explore collaborations, and develop impactful solutions that contribute to a more resilient and sustainable world.

With warm regards,

Dr. Meenakshi Sharma

Dean, Mangalmay Institute of Management and Technology

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ROLE OF ETHICAL LEADERSHIP AND ORGANIZATIONAL CULTURE IN CAREER SATISFACTION IN ACADEMIC SECTOR

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Abstract

In today's competitive and evolving business landscape, career satisfaction has emerged as a pivotal determinant of employee retention, productivity, and organizational success. This study explores the interrelationship between ethical leadership, organizational culture, and career satisfaction, with a specific focus on the academic sector. Ethical leadership characterized by integrity, transparency, fairness, and accountability establishes a foundation of trust and respect, promoting employee engagement and commitment. Simultaneously, organizational culture, defined by shared values and behavioral norms, influences workplace dynamics, fostering inclusivity, collaboration, and alignment with institutional goals.

The research adopts a descriptive design and utilizes a structured Likert-scale questionnaire distributed to 150 academic professionals, yielding 120 valid responses. Data were collected using convenience sampling and analyzed through word-cloud for qualitative insights and Partial Least Squares Structural Equation Modeling (PLS-SEM) for quantitative analysis. The findings reveal that ethical leadership and a positive organizational culture significantly impact career satisfaction by nurturing psychological empowerment, fostering trust, and providing growth opportunities. Respondents highlighted the importance of transparent communication, fairness in promotions, and supportive work environments in enhancing their career fulfillment.

Moreover, the findings underscore the importance of cultivating ethical leaders and reinforcing organizational values that prioritize employee well-being. In academic institutions, where collaboration, fairness, and professional development are crucial, these factors are particularly vital. This research provides actionable insights for educational institutions aiming to enhance faculty satisfaction and institutional performance. By investing in ethical leadership development and nurturing a supportive culture, organizations can create environments that promote long-term employee satisfaction, reduce turnover, and drive sustained organizational success.

Keywords - Career Satisfaction, Ethical Leadership, Organizational Culture, Academic Sector, Employee Engagement, Psychological Empowerment

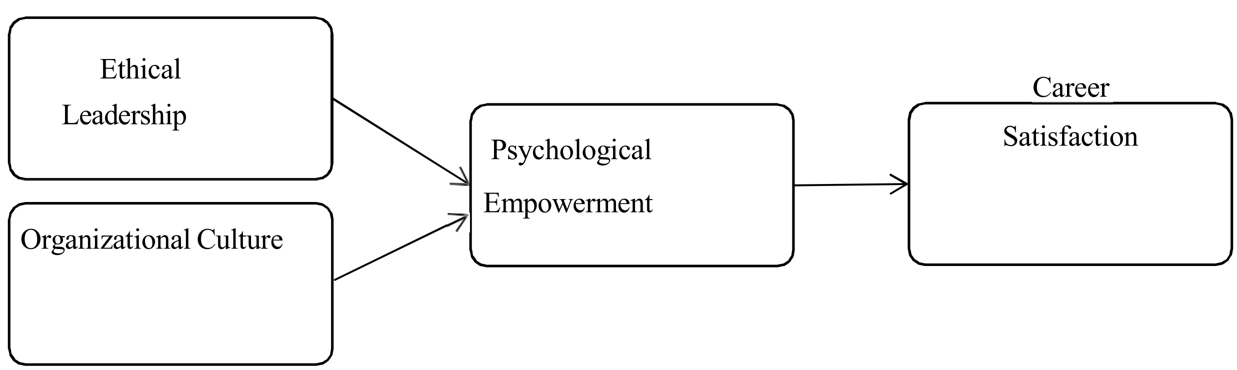
1. Introduction

In today's highly competitive and rapidly changing business environment, career satisfaction has emerged as a critical factor influencing employee retention, productivity, and overall organizational success. Two fundamental elements at the heart of fostering career satisfaction are ethical leadership and organizational culture. Ethical leadership, characterized by integrity, fairness, accountability, and transparency, sets the standard for behavior within organizations, directly shaping employees' experiences. Similarly, organizational culture the shared values, beliefs, and practices of a company influences how employees interact, collaborate, and engage with their work. When ethical leadership and a strong, positive culture align, they create an environment where employees feel respected, motivated, and connected to the organization's mission. A workplace rooted in ethical principles and positive cultural values fosters trust, enhances communication, supports career development, and promotes work-life balance. Employees who experience such an environment are more likely to remain loyal, perform at higher levels, and contribute to the organization's long-term success. Conversely, a lack of ethical leadership or a toxic culture can lead to dissatisfaction, disengagement, and high turnover rates. This project explores the dynamic relationship between ethical leadership, organizational culture, and career satisfaction, aiming to identify strategies that organizations can implement to build supportive, ethical, and thriving workplaces.

2. Review of Literature

Rana et al. (2024) found that most employees reported satisfaction with their jobs and rated their job performance as moderate to high. Among leadership styles, transformational leadership was most favored, followed by transactional and democratic styles, while autocratic and laissez-faire styles received lower evaluations. This indicates that workers prefer leaders who motivate, involve them in decision-making, and set clear objectives with rewards. **Sarwar, H. et al. (2023)** explored the growing interest in workplace spirituality, highlighting its importance for modern organizations. Their study aimed to assess the influence of ethical leadership on job satisfaction and workplace spirituality, also examining how self-efficacy and spirituality act as mediators and moderators between ethical leadership and job satisfaction. **Nneji, N. E. et al. (2021)** investigated the link between organizational culture and performance, suggesting that companies with strong cultures experience enhanced employee satisfaction and productivity. Since cultural values are measurable, they recommended incorporating both financial and cultural variables when studying performance. The study stressed that management must actively guide employees in embracing organizational culture to achieve business goals. **Sapta, I. et al. (2021)** proposed that job satisfaction, technological advancements, and organizational culture significantly boost employee motivation, which in turn enhances performance. Happy employees are more driven and productive. However, the study noted that while motivation positively impacts performance, organizational culture itself does not have a direct significant effect on employee performance. **Ridlwan, M. et al. (2021)** stressed the importance of organizational culture and leadership in driving organizational performance. Their research found that effective leadership and a strong culture lead to greater employee satisfaction, which mediates improvements in performance. They concluded that boosting job satisfaction is crucial for enhancing employee output and recommended focusing efforts in this area. **Sari, F., Sudiarditha, I. K. R., & Susita, D. (2021)** used path analysis to explore how leadership style and organizational culture affect job satisfaction and performance. Their findings confirmed that organizational culture positively influences leadership style and job satisfaction, and that job satisfaction, in turn, enhances performance. **Goswami, A. K. (2021)** studied perceptions of ethical leadership in organizations, examining whether personal demographics like gender, age, work experience, executive level, qualifications, industry, and sector shape employees' views of their supervisors' ethical conduct. **Metwally, D. et al. (2019)** demonstrated that ethical leadership positively influences employees' adaptability to change, with organizational culture mediating this relationship. Their research suggests that ethical leadership shapes organizational culture in ways that enhance overall effectiveness and employee flexibility, offering valuable insights for leadership and change management studies.

PROPOSED MODEL



3. Research Methodology

Table 3.1: Research Methodology Summary

PARAMETERS	FACTS
Type of Research Design	Descriptive and Exploratory research
Area of study	Academic sector in Delhi NCR
Data Collection Methods and Tools	Structured Questionnaire using 5-Point Likert Scale
Sampling Techniques	Non Probability sampling : Convenience Sampling
Population	120
Data Analysis tool, Techniques	EFA using Smart PLS, word cloud using Nvivo
Source of Data	Primary Data

4. Data Analysis and Interpretation

Table 4.1: Demographic Factors

Demographic Variable	Category	Frequency	Percentage
Age	20 - 30	28	23.3
	30 - 40	43	35.8
	40 – 50	41	34.2
	Above 50	8	6.7
Gender	Male	41	34.2
	Female	79	65.8
Designation	Teacher	21	17.5
	Professor	41	34.2
	Research Scholar	24	20.0

	Administrative Staff	25	20.8
	Others	9	7.5

The demographic profile of the sample highlights key patterns related to age, gender, and professional designation. Regarding age distribution, most participants fall within the 30–50-year range. Specifically, 35.8% are between 30 and 40 years old, while 34.2% are aged 40 to 50. A smaller segment, 23.3%, consists of individuals aged 20 to 30 years, and only 6.7% are over 50. This demonstrates that the majority of respondents are in their thirties and forties. In terms of gender, the sample is notably female-dominated, with women constituting 65.8% of participants compared to 34.2% men, reflecting a clear gender imbalance favoring females. Examining professional roles, professors form the largest group at 34.2%, followed by administrative staff at 20.8%, and research scholars at 20.0%. Teachers represent 17.5% of the sample, while 7.5% fall into an "others" category, which likely includes various unspecified positions.

4.1 Qualitative Analysis

Figure 4.1: Word cloud: explore the words most frequently used
(Source: Research Output)

The word cloud provides a visual representation of the key concepts related to organizational culture, ethical leadership, and employee satisfaction, particularly in an academic context.

Prominent terms like "culture," "ethical," "leaders," "organizational," "satisfaction," and "career" suggest that the main focus is on how ethical leadership and a strong organizational culture impact employee engagement and career development. Leadership and decision-making are emphasized through frequent mentions of "leaders," "leadership," and "decisions," highlighting their central role in shaping a positive work environment. The presence of words such as "academic," "universities," "professors," and "students" indicates that the discussion is situated largely within educational institutions. Additionally, concepts like "values," "integrity," "fairness," and "responsibility" underline the necessity of fostering an ethical and transparent environment. Overall, the word cloud suggests that cultivating ethical leadership and a positive organizational culture significantly enhances employee satisfaction, career growth, and organizational success.

4.2 Quantitative Analysis

Table 4.2 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.817
Bartlett's Test of Sphericity	Approx. Chi-Square	1866.294
	df	496
	Sig.	<.001

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.817, indicating good sampling adequacy for factor analysis. Values above 0.80 are considered meritorious and suggest that the patterns of correlations are relatively compact, which should yield distinct and reliable factors. Bartlett's Test of Sphericity produced a Chi-Square value of 1866.294 with 496 degrees of freedom, and was statistically significant ($p < .001$). This indicates that the correlation matrix significantly differs from an identity matrix, meaning that there are meaningful relationships among variables that justify the use of factor analysis.

Table 4.3 Reliability Statistics

Cronbach's Alpha	**N of Items**
0.934	32

The Cronbach's Alpha for the scale was 0.934 across 32 items, indicating excellent internal consistency. A Cronbach's Alpha value above 0.9 suggests that the items are highly correlated and consistently measure the same underlying construct.

Table 4.4 Exploratory Factor Analysis Summary

S.no	Factors	Coding	EGIN Values
1	**Career Satisfaction**	CS1	0.756
		CS2	0.669
		CS3	0.651
		CS4	0.65
		CS5	0.736
2	**Ethical Leadership**	EL1	0.54
		EL2	0.715
		EL3	0.726
		EL4	0.639
		EL5	0.708
		EL6	0.648
		EL7	0.701
3	**Organizational culture**	OC1	0.59
		OC10	0.691
		OC11	0.618
		OC12	0.533
		OC13	0.601
		OC14	0.61
		OC15	0.685
		OC2	0.659
		OC3	0.719
		OC4	0.644
		OC5	0.668
		OC6	0.641
		OC7	0.666
		OC8	0.606
		OC9	0.692
4	**Psychological empowerment**	PE1	0.679
		PE2	0.619
		PE3	0.723
		PE4	0.588
		PE5	0.689

The Exploratory Factor Analysis (EFA) reveals four distinct and well-defined factors: Career Satisfaction, Ethical Leadership, Organizational Culture, and Psychological Empowerment. All items across the factors exhibit satisfactory factor loadings, ranging from 0.533 to 0.756, indicating good construct validity. Career Satisfaction items show strong loadings (0.65–0.756), suggesting consistent measurement of the construct. Ethical Leadership items also load moderately to strongly (0.54–0.726), with EL1 being the weakest but still acceptable. Organizational Culture, comprising 15 items, demonstrates overall solid loadings (0.533–0.719), with OC3 and OC9 standing out as strong indicators. Psychological Empowerment items load well (0.588–0.723), confirming reliable representation. Overall, the EFA supports the validity and structure of the measurement model.

Structured Model

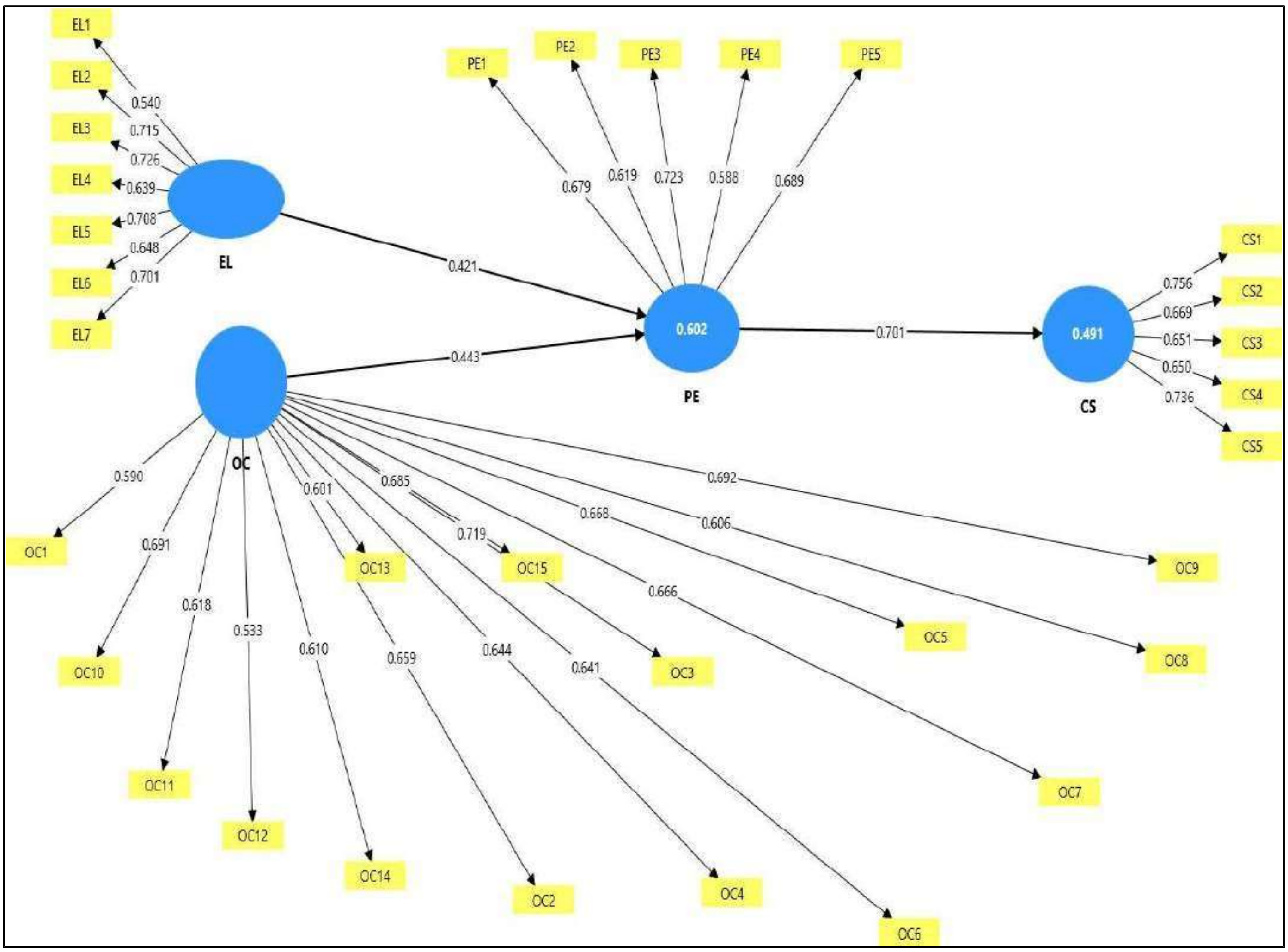


Table 4.5 Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Status
EL -> PE	0.421	0.411	0.099	4.245	0	Accepted
OC -> PE	0.443	0.462	0.092	4.796	0	Accepted
PE -> CS	0.701	0.707	0.069	10.16	0	Accepted

The path coefficient analysis shows statistically significant and positive relationships among the constructs. Ethical Leadership (EL) has a positive impact on Psychological Empowerment (PE) with a path coefficient of 0.421 and a strong t-value of 4.245, indicating a significant effect ($p < 0.001$). Similarly, Organizational Culture (OC) significantly influences Psychological Empowerment (PE) with a slightly higher coefficient of 0.443 and a t-value of 4.796 ($p < 0.001$). Most notably, Psychological Empowerment (PE) strongly predicts Career Satisfaction (CS) with a high path coefficient of 0.701 and a t-value of 10.16 ($p < 0.001$). All relationships are statistically significant at the 0.05 level, supporting the proposed hypotheses and indicating that both Ethical Leadership and Organizational Culture positively contribute to Psychological Empowerment, which in turn strongly enhances Career Satisfaction.

Table 4.6 Construct reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CS	0.729	0.731	0.822	0.481
EL	0.797	0.807	0.85	0.45
OC	0.898	0.9	0.913	0.414
PE	0.676	0.68	0.794	0.437

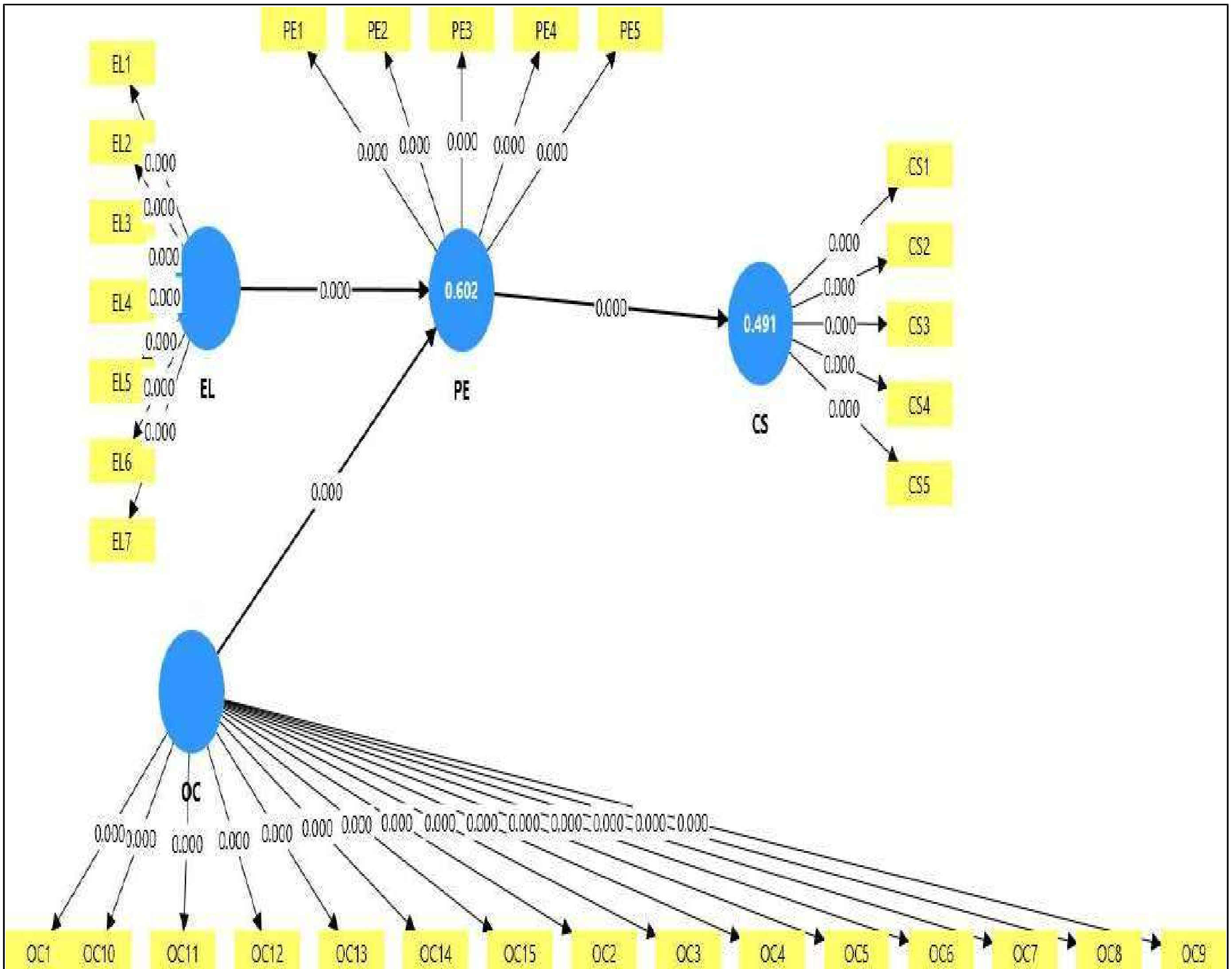
The construct reliability and validity measures indicate that the scales used for Career Satisfaction (CS), Ethical Leadership (EL), Organizational Culture (OC), and Psychological Empowerment (PE) have acceptable levels of internal consistency and reliability. Cronbach's alpha values for CS (0.729), EL (0.797), and OC (0.898) are above the conventional threshold of 0.7, whereas PE is slightly lower at 0.676, suggesting a marginally lower internal consistency for the latter. Similarly, composite reliability measures (rho_a and rho_c) are robust across constructs, ranging from 0.731 to 0.913, further supporting the reliability of the scales. However, the Average Variance Extracted (AVE) values are slightly below the ideal benchmark of 0.50 for all constructs (CS = 0.481, EL = 0.45, OC = 0.414, PE = 0.437), indicating that while the items reliably measure their respective constructs, a relatively lower proportion of variance is captured by the underlying latent factors. Overall, these statistics support the reliability of the constructs with some area for improvement in convergent validity.

Table 4.7 Discriminant validity fornell - larcker criterion

	CS	**EL**	**OC**	**PE**
CS	0.694			
EL	0.521	0.671		
OC	0.741	0.613	0.643	
PE	0.701	0.693	0.701	0.661

The Fornell-Larcker criterion results provide overall support for discriminant validity among the constructs. The square roots of the Average Variance Extracted (AVE), presented on the diagonal, are generally comparable to or higher than the inter-construct correlations, indicating that each construct shares more variance with its own indicators than with other constructs. For example, Career Satisfaction (0.694) and Ethical Leadership (0.671) have diagonal values that exceed or closely match their correlations with other constructs, demonstrating acceptable levels of distinctiveness. While some correlations are relatively high—such as between Organizational Culture and Career Satisfaction (0.741)—this can be attributed to theoretical relatedness rather than measurement redundancy. Overall, the results suggest that the constructs exhibit acceptable discriminant validity and are sufficiently distinct to justify their use in the structural model.

Measurement Model



The findings of the study reveal strong evidence that the survey instruments effectively measured the intended constructs, with notable factor loadings for Career Satisfaction and Ethical Leadership. Specifically, the item CS1 (Career Satisfaction) recorded the highest factor loading at 0.756, confirming its strength as a key indicator. Within the Ethical Leadership dimension, EL3 and EL2 showed the strongest loadings at 0.726 and 0.715 respectively, highlighting essential ethical behaviors perceived by respondents. Organizational Culture was well represented by items OC3 and OC9, indicating that specific cultural practices were particularly significant. Psychological Empowerment also demonstrated solid factor loadings, notably PE3 at 0.723, reinforcing its vital role in influencing satisfaction. The PLS-SEM path analysis provided empirical support for the mediating role of Psychological Empowerment between leadership, culture, and satisfaction, with high t-values indicating strong statistical robustness and p-values below 0.001 confirming high significance across the model. A strong correlation (0.741) was observed between Organizational Culture and Career Satisfaction, suggesting a meaningful practical relationship. Despite slightly lower AVE values, the composite reliability scores remained high for constructs like Organizational Culture (0.913) and Ethical Leadership (0.85), affirming the reliability of the measurements. NVivo-based thematic analysis further emphasized the importance of trust, transparency, and fairness in leadership for enhancing job satisfaction. Participants also associated empowerment with academic freedom, recognition, and the opportunity to contribute to institutional objectives. Some responses pointed to the need for reforms in administrative processes to reduce bureaucratic hurdles. Overall, the findings underscore the critical impact of a positive work environment and ethical leadership in boosting faculty morale and satisfaction. The study offers strong empirical evidence that fostering ethical leadership and a healthy organizational culture indirectly enhances satisfaction through empowerment, aligning closely with the proposed theoretical framework and validating the conceptual model tested via PLS-SEM.

6. Conclusion

Ethical leadership and organizational culture are crucial in influencing career satisfaction. Leaders who exhibit transparency, fairness, and accountability foster an environment of trust and respect, enhancing employees' overall fulfillment at work. When employees view their leaders as ethical and fair, their commitment to their roles and organizations strengthens, leading to higher job satisfaction. A positive organizational culture, grounded in shared values, inclusiveness, and ethical conduct, deepens employees' sense of belonging and supports a work environment where they feel appreciated and respected. This, in turn, boosts engagement and motivation. The study highlights that such environments promote collaboration and productivity, significantly contributing to career satisfaction. Psychological empowerment emerges as a critical link between ethical leadership, organizational culture, and career satisfaction. Employees who feel empowered, capable, and impactful are more likely to find satisfaction in their careers. The findings emphasize the need to nurture a culture that values empowerment, trust, and professional growth, especially within academic institutions where fairness and collaboration are key to faculty and researcher satisfaction. By pinpointing elements like trust, career development, work-life balance, and effective communication, the study offers actionable strategies for improving employee retention and organizational productivity. Ultimately, organizations that align ethical leadership with a strong cultural foundation create workplaces that support long-term employee engagement and institutional success.

References:

- Akpa, V. O., Asikhia, O. U., & Nneji, N. E. (2021). Organizational culture and organizational performance: A review of literature. International Journal of Advances in Engineering and Management, 3(1), 361-372.
- Aftab, J., Sarwar, H., Kiran, A., Qureshi, M. I., Ishaq, M. I., Ambreen, S., & Kayani, A. J. (2023). Ethical leadership, workplace spirituality, and job satisfaction: moderating role of self-efficacy. International Journal of Emerging Markets, 18(12), 5880-5899.
- Goswami, M., Agrawal, R. K., & Goswami, A. K. (2021). Ethical leadership in organizations: evidence from the field. International Journal of Ethics and Systems, 37(1), 122-144.
- Mwesigwa, R., Tusiime, I., & Ssekiziyivu, B. (2020). Leadership styles, job satisfaction and organizational commitment among academic staff in public universities. Journal of Management development, 39(2), 253-268.
- Metwally, D., Ruiz-Palomino, P., Metwally, M., & Gartzia, L. (2019). How ethical leadership shapes employees' readiness to change: The mediating role of an organizational culture of effectiveness. Frontiers in psychology, 10, 2493.
- Novitasari, D., Riani, A. L., Suyono, J., & Harsono, M. (2021). The moderation role of ethical leadership on organisational justice, professional commitment, and organisational citizenship behaviour among academicians. International Journal of Work Organisation and Emotion, 12(4), 303-324.
- Qing, M., Asif, M., Hussain, A., & Jameel, A. (2020). Exploring the impact of ethical leadership on job satisfaction and organizational commitment in public sector organizations: The mediating role of psychological empowerment. Review of Managerial Science, 14(6), 1405-1432.
- Ridlwan, M., Purwandari, D. A., & Syah, T. Y. R. (2021). The effect of situational leadership and organizational culture on employee performance through job satisfaction. International Journal of Multicultural and Multireligious Understanding, 8(3), 73-87.
- Sahito, Z., & Vaisanen, P. (2020). A literature review on teachers' job satisfaction in developing countries: Recommendations and solutions for the enhancement of the job. Review of Education, 8(1), 3-34.

- SAPTA, I., Muafi, M., & SETINI, N. M. (2021). The role of technology, organizational culture, and job satisfaction in improving employee performance during the Covid-19 pandemic. The Journal of Asian Finance, Economics and Business, 8(1), 495-505.
- Sari, F., Sudiarditha, I. K. R., & Susita, D. (2021). Organizational culture and leadership style on employee performance: Its effect through job satisfaction. The International Journal of Social Sciences World (TIJOSSW), 3(2), 98-113
- Saleh, R., & Atan, T. (2021). The involvement of sustainable talent management practices on employee's job satisfaction: Mediating effect of organizational culture. Sustainability, 13(23), 13320.
- Sengullendi, M. F., Bilgeturk, M., & Afacan Findikli, M. (2024). Ethical leadership and green innovation: the mediating role of green organizational culture. Journal of Environmental Planning and Management, 67(8), 1702-1723.
- Swamy, C. J., Rana, A., Adarsh, A., & Lathamani, B.(2024) A study on effectiveness of ethical leadership on employee job satisfaction and performance with reference to select it companies, bangalore. International Journal of Exclusive Management Research, 14(5).

CONSTITUTIONAL RIGHTS OF HOMELESS WOMEN AND CHILDREN

DR.DEEKSHA TEWARI

Abstract

It has come to the finding that there has been large number of migrants rise in India and their portion of homeless population has searched to a greater extent. Despite having municipal laws to protect their right to life developing country like India is facing shortage in housing its population. To safeguard homeless women and child it is essential to protect them from any form of exploitation for instance violence has been one of the major challenges for these homeless population. It is essential to practice access to justice keeping in mind our constitutional mandate. Article 21 plays a vital role in protecting the homeless population. There is an urgent need to provide adequate shelter, livelihood, health camps to maintain a better quality of life. Though we have domestic violence act and laws for protection of women and child. It is important to have proper implementation of the laws. This paper will try to analyze to what extent the human rights of homeless people are affected and what could be done to combat the violation of human rights. Homelessness leads to a variety of consequences of indulging in criminal acts which leads to societal fear. To strike a balance, the government must take necessary steps to ensure that homeless people get access to basic human rights.

Keywords: Human Rights, Constitutional Law, Fundamental Rights, Fundamental Duties, Homeless Women, Homeless Children

Introduction

Homelessness is a socio legal concern worldwide. There are several states that have adequate resources to address the issue of statelessness. Homelessness leads to violation of several rights along with indicating states failure to guarantee access to safe, affordable and adequate housing for all.

Homeless people are not stable, safe, and lack adequate housing. Definition of Homeless used by UN Habitat "one of the most acute forms of material deprivation. Homelessness refers to the inability of people to enjoy a permanent accommodation."[1]

As per the report of the Secretary General on affordable housing and social protection systems for all to address homelessness. The definition of Homelessness is not merely a lack of physical housing, but it is also a loss of family, community, and a sense of belonging. It is a failure to access a lot of other human right to grow economically and live a safe and decent life. it is described as a condition, a situation where an individual or household lacks house with a sense of security of tenure, rights, and ability to enjoy social relations including safety and includes a variety of people who experience homelessness like people living on streets, open spaces, slums etc.,

The Universal Declaration of Human Rights (UDHR) as adopted by the UN General Assembly defines a "Homeless as those who do not live in a regular residence or pakka houses due to lack of adequate housing, safety, and availability."

[1] Homelessness and Human Rights available at: OHCHR | Homelessness and human rights

India defines the situation of homeless as those individuals who do not live in the houses but rather are found on streets, pavements, underground crossings on the platforms in railway station, the stairs of temple, or any open area.

The census of India 2011 defines houseless household as households who do not live in buildings or census houses but live in the open on pavement, roadside, railway station, staircase of temple etc. According to 2011 census India has around 1.77 million homeless. 52% of which live in urban areas of the country. This number is also not the exact number, and the actual number can be more double. In India 68 million people are living in an informal settlement in our country.[2]

Constitutional Rights of Women

There are a lot of rights that surround Right to Life and personal liberty under the Constitutional of India. These rights are expressly stated under various articles, but it was very much implied in the person since the day it takes it first breathe in the world. Our constitution has adopted various provisions from various countries and the fundamental rights have been made in line with the UDHR. Women in India has ample of rights which will be discussed in detail:
1. Article 15(1) of the Constitution of India gives a direction to the state not to discriminate against any native of India on the grounds of sex. Further in the same article 15(3) the state is obliged to make special provision for women. It must make some special provision to further their growth.[3]

2. In Article 16(2) it is specifically directed to state that the citizen will not be segregated based on sex.[4]

3. In Article 39(e) under the Directive Principles of State Policy DPSP the state is responsible to ensure that the strength of women workers is not abused and that they are not obliged by economic necessity to enter avocation unsuited to their strength.[5]

4. Article 39(a) directs the state to ensure to secure for men and women equally the right to an adequate means of livelihood. [6]

5. The Constitution under Article 39(d) directs and mandates the state to secure equal pay for equal work for men and women. It tries to ensure that both men and women have access to adequate livelihood.

6. Article 23(1) provides every citizen with the fundamental right as human trafficking and forced labour.

The Directive Principle of State Policy under article 42 puts a responsibility on the state to make provision to ensure just and humane conditions for work and maternity relief. This is in no way a instrument of social transformation also give forth measures and institutional mechanisms to ensure equal participation of women in the society.

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[2] Housing and Land Rights Network available at: [HLRN]
[3] The Constitution of India, 1948 Article 15
[4] The Constitution of India, 1948 Article 16
[5] The Constitution of India, 1948 Article 39 (e)
[6] The Constitution of India, 1948 Article 39 (a)

Constitutional Provisions for Children

The Universal Declaration of Human Rights and the International regime. A child includes every human being under the age of 18 years. The definition is provided in the United Nations Convention on the rights of children. The key points thus universally accepted regarding the childhood:

1. All children under the age of 18.
2. Every human being has come through the age of childhood.
3. Children have different experiences as they mature.
4. It is the state who needs to protect children from abuse and exploitation.

Childhood is the beginning of the journey of life. If the children are subjected to any abuse in this age. It may have a lasting impact on the child's character. This sort of exploitation of any kind stifles the proper development of the child's personality. Children are at high risk of becoming vulnerable to mental or physical attack on them. It is natural that in this age they may not be able to distinguish and identify the acts of abuse and exploitation. Even in this scenario when children could not identify the acts, they fail to bring the attention of the guardians. It is the sole responsibility of the governing to ensure that the rights of children should be protected, and a sense of security needs to be given to them. This security could be ensured by providing them with shelter for them where they are living in a safe environment. These children will not be sleeping in the open and would at least have a sense of warmth and a house where their basic rights are provided. The directive principles of state policy although gives the state a little freedom in respect to matters of legislation. Although Fundamental Rights and the Directive Principles of State Policy are a support to each other, and the Fundamental Rights are enforceable in the court whereas DPSP is not enforceable in the court. DPSP is a kind of guideline that aims to ensure the proper implementation of Fundamental Rights. Article 21A[7] right to free and compulsory elementary education for all children in the age group of 6-14 years. The right to education was before the 86th Amendment Act was implicit in the right to life and personal liberty, but this provision was expressed in the constitution in 2002 and the Supreme Court for the first-time recognized education as the most indispensable part of the right of life.

The Article 45[8] of DPSP right to early childhood care and education to all children until they complete the age of six years this article stressed on the importance of state sponsored compulsory elementary education to children upto 14 years of age. To ensure safety article 24 prohibits the employment of children in factories etc. This article specifically provides the right to be protected from any hazardous employment till the age of 14 years.

Conclusion

The government needs to have certain provisions which could help combat vulnerability of Homeless Women and Children to ensure that the basic human rights of individuals. This would protect the rights and would also at the same time help in Lessing up crime in Delhi. It would ensure them with proper environment which would lead to healthy growth of children. Childhood is an age where the child needs proper care and attention of parents. In this age the child needs a safe environment which furthers his growth in right direction. It is important to provide homeless people with a housing facility where they can shelter themselves and ensure that their right to life and to live with dignity can be ensured.

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[7] The Constitution of India, 1948
[8] The Constitution of India, 1948

A STUDY ON CUSTOMER PERCEPTION TOWARDS OPERATIONS AND CUSTOMER SERVICE THROUGH E – BANKING

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Abstract

The Indian banking sector has undergone a remarkable transformation from its colonial-era origins to a modern, technology-driven financial system. Modern banking in India began in the late 18th century with the establishment of institutions such as the Bank of Hindustan in 1770 and the General Bank of India in 1786. The formation of the three Presidency Banks—Bank of Calcutta (1806), Bank of Bombay (1840), and Bank of Madras (1843)—set the foundation for organized banking in the country. These institutions were later merged in 1921 to form the Imperial Bank of India, which was eventually nationalized and renamed the State Bank of India (SBI) in 1955.

The foundation for a centralized regulatory body in the Indian financial sector was established in 1935 with the creation of the Reserve Bank of India (RBI) under the Reserve Bank of India Act. Significant government involvement in banking occurred in the years following independence, most notably the nationalization of six major private banks in 1980 and fourteen major banks in 1969. These initiatives sought to advance rural banking, financial inclusion, and more efficient use of resources in support of national development objectives.

By the early 2000s, the Indian banking landscape had become diverse, comprising Public Sector Banks (PSBs), Private Sector Banks, Foreign Banks, Regional Rural Banks (RRBs), and Co-operative Banks. PSBs continue to dominate, holding over 78% of the total banking assets. However, they face several challenges, including high non-performing asset (NPA) levels, an aging workforce, and technological lag. In contrast, private and foreign banks have rapidly adopted modern banking solutions such as online banking, mobile applications, ATMs, and telebanking services, enhancing customer experience and operational efficiency.

Several regulatory changes, such as tighter asset classification rules, increased provisioning standards, and exposure limitations, have been implemented to fortify the banking sector. With projections indicating a 30–40% growth in the upcoming years, the emergence of retail banking, especially in mortgage lending, has emerged as a significant growth driver.

Furthermore, the establishment of the Credit Information Bureau (India) Limited (CIBIL) in 2000 has contributed to a more transparent and reliable credit ecosystem by enabling banks to access borrower information more efficiently.

Keywords: Indian Banking History, Reserve Bank of India, Public Sector Banks, Foreign Banks in India, Private Sector Banks, Nationalization of Banks, Non-Performing Assets (NPAs), Technological Advancements in Banking, Retail Banking, Mortgage Lending, Credit Information Bureau (CIBIL), Asset Classification Norms, Economic Development.

Introduction

The Indian banking sector has played a pivotal role in shaping the country's economic development and financial architecture. From its modest beginnings in the late 18th century with the establishment of early institutions such as the Bank of Hindustan and the General Bank of India, the Indian banking system has evolved through multiple phases of institutional reform, nationalization, liberalization, and technological advancement. A landmark moment in this journey was the creation of the Reserve Bank of India (RBI) in 1935, which became the central regulatory authority overseeing the monetary and financial stability of the country.

The Indian government implemented a number of important changes to democratize and fortify the banking sector after gaining independence. The goal of nationalizing large private banks in 1969 and 1980 was to provide banking services to underbanked and rural populations. The largest public-sector bank in the nation was established in 1955 when the Imperial Bank of India changed its name to the State Bank of India (SBI). SBI has a significant presence and influences national financial inclusion programs.

Notwithstanding their dominance—PSBs make up more than 78% of all banking assets—problems like non-performing assets (NPAs), antiquated technology, and operational inefficiencies have hindered their effectiveness. On the other hand, private and international banks have become important forces behind modernization, using advancements in mobile platforms, digital banking, and customer-focused services to gain a larger portion of the market.

Stricter asset classification guidelines, provisioning criteria, and credit monitoring procedures are just a few of the recent regulatory changes the RBI has implemented with the goal of enhancing the financial system's resilience and transparency. A more data-driven and customer-focused banking environment is being ushered in by the growth of retail banking, especially in the mortgage sector, and the creation of the Credit Information Bureau (India) Limited (CIBIL).

Literature Review

Ms. Fozia (2013) investigated how consumers in various age groups and professions felt about e-banking services. According to her research, demographic characteristics have a big impact on how consumers feel about online banking, which highlights the necessity for banks to comprehend consumer expectations in order to provide better customer service.

The importance of information and communication technology (ICT) in transforming the banking industry in underdeveloped nations was emphasized by Jayshree Chavan (2013). She underlined that although internet banking improves operational effectiveness and consumer satisfaction, it also presents issues like security risks that need to be addressed.

Security and trust were the main determinants of corporate clients' acceptance of internet banking in Jordan, according to Muhammad S. Alnsour & Khalid Al-Hyari (2011). Their research verified that these elements have a major impact on adoption patterns, particularly in developing markets that are fragmented.

Suryanarayana and Sudhakar A. M. (2011) looked into India's expanding mobile banking market. They discovered that mobile banking lowers transaction costs and promotes financial inclusion, increasing the unbanked population's access to banking services.

In 2009, Hernan E. Riquelme and Khalid A. Mekkaoui conducted a study on Middle Eastern customers' satisfaction with online banking. Their findings showed that while customer satisfaction levels did not always translate into higher usage frequency, service quality—including speed and information relevance—significantly influences consumer contentment.

Pooja Malhotra and Balwinder Singh (2009) investigated the effects of internet banking on Indian banks' risk and performance. According to their research, online banks are typically more efficient and lucrative than traditional banks, but they also rely more heavily on core deposits.

Rajesh Kumar Srivastava (2007) investigated consumer attitudes and the variables affecting the use of online banking. His research highlighted the significance of trust, security, knowledge, and technological aptitude in promoting adoption, pointing out that many consumers were apprehensive because of perceived complexity or unfamiliarity.

Research Methodology

Scope of the Study

This study focuses on the retail banking customers in India who use e-banking services. It covers both private and public sector banks and assesses service quality, complaint resolution, and the customer-bank relationship.

Research Design

This study follows a **descriptive research design**, as it aims to explore and describe the current perceptions, experiences, and satisfaction levels of customers regarding e-banking operations and services.

Data Collection Method

Secondary Data: Collected from published articles, bank websites, reports, journals, and previous research studies related to e-banking and retail banking in India.

Objectives of the Study

- To assess customer satisfaction with e-banking services provided by various banks.
- To identify the challenges faced by customers in using e-banking platforms.
- To analyse the impact of e-banking on retail banking growth and customer retention.
- To evaluate how effectively banks resolve customer complaints and maintain long-term relationships.

Limitations of the Study

- The sample size may not represent the entire population.
- Responses may be biased due to individual perceptions.
- Time constraints limited the scope and geographic reach of the survey.

Findings

1 **High Usage for Convenience and Time-Saving**

A significant number of respondents reported that they prefer e-banking services primarily due to the convenience it offers. The ability to conduct transactions quickly and save time has been identified as a major motivation for adopting digital banking platforms.

2 Strong Awareness in Urban Areas

In the Ahmedabad region, a majority of the customers are well-aware of internet banking services. The accessibility to technology and increased digital literacy in urban areas has contributed to the widespread use of e-banking among residents.

3 Customer Satisfaction with Speed and Cost-Effectiveness

Most users expressed satisfaction with e-banking services, noting that online transactions are not only faster but also more cost-effective compared to traditional banking methods. The reduction in paperwork and elimination of long queues in banks were seen as major advantages.

4 Digital Divide Due to Lack of Education and Awareness

A portion of the population, particularly those who are less educated, expressed hesitation and distrust towards using e-banking services. Lack of awareness, digital literacy, and fear of making mistakes or falling victim to fraud are significant barriers to adoption among this group.

5 Preference for ATMs among Business Users

Businessmen and daily cash users showed a strong preference for ATM facilities. The ability to withdraw cash anytime and from various locations was seen as a highly valuable feature for their day-to-day transactions.

Conclusion

The study on *"Customer Perception Towards Operation & Customer Service Provided Through E-Banking"* has provided valuable insights into the growing relevance of e-banking in today's fast-paced digital era. It is evident that most customers are increasingly shifting towards e-banking services due to the convenience, speed, and cost-effectiveness it offers.

However, the study also highlights certain challenges faced by customers, especially those who are less educated or digitally unaware. Issues related to trust, lack of information, and concerns over security remain significant barriers. It is therefore essential for banks to take proactive steps—such as organizing regular meetings between e-banking officers and customers, offering clear instructions at service desks, and providing comprehensive training sessions for both clients and staff.

Furthermore, addressing technology-related and security concerns must be a key part of customer service to ensure a secure and seamless banking experience. Educating customers on safety measures, such as keeping their passwords confidential, can help build trust in the system.

CONSUMER BEHAVIOR ANALYSIS IN E-COMMERCE: EXPLORING FACTORS INFLUENCING PURCHASE DECISIONS IN INDIA

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Abstract

With an emphasis on the Delhi NCR area, the study "Consumer Behaviour Analysis in E-commerce: Exploring Factors Influencing Purchase Decisions in India" provides a thorough analysis of the major factors influencing Indian customers' online buying habits. Businesses looking to gain a competitive edge now need to understand consumer preferences as e-commerce continues to change the retail landscape. The survey highlights how young customers, especially those between the ages of 18 and 25, who are mostly students and frugal, are becoming more and more dominant in online retail. While Myntra has established a niche in the apparel retail industry, major platforms such as Amazon and Flipkart are the most popular. One hundred respondents were given a structured questionnaire to complete in order to gather primary data on customer attitudes, behaviours, and e-commerce difficulties.

Price sensitivity, discounts, product reviews, and confidence in digital platforms are important elements that impact purchasing decisions. While 68.4% of consumers said reviews were extremely essential, discounts (52.6%) and customer reviews (46.5%) were found to be the most deciding factors. Despite the widespread usage of digital payment methods like UPI, 34.2% of respondents still prefer Cash on Delivery (COD), underscoring persistent worries about trust. Particularly among young people, social media has a moderate to high influence. Sites like YouTube and Instagram serve as conduits for peer recommendations and influencer marketing. Problems like expensive delivery, subpar products, and difficult return procedures also have an impact on customers, which can result in problems like cart abandonment and discontent.

The results indicate that although customers are adopting online shopping due to its convenience, a number of obstacles—such as delivery delays, data privacy concerns, and fraud, which was reported by 42.1% of respondents—continue to undermine trust. Additionally, a lot of respondents said that more affordable prices and safe platforms may encourage people to shop online more frequently. The study comes to the conclusion that companies need to make investments in safe payment methods, clear return guidelines, and excellent customer support. Customer involvement can be further improved by using social media, competitive pricing, and personalised marketing. Long-term success in India's e-commerce industry depends on ongoing consumer behaviour study as digital commerce develops.

Keywords: E-commerce**,** Consumer Behavior**,** Purchase Decisions**,** Digital Trust**,** Social Media Influence

Introduction

With its unparalleled convenience, wide selection of products, and fiercely competitive prices, e-commerce has completely transformed the worldwide retail sector. The quick development of internet infrastructure, the pervasive use of smartphones, and the acceptance of digital payment methods have all contributed to this change in the Indian setting. Websites like Amazon, Flipkart, and Meesho have gained widespread recognition and transformed the way that millions of people shop nationwide. Businesses must comprehend the behavioural patterns that influence online purchasing decisions as the market becomes more competitive and consumer expectations change.A wide range of psychological, cultural, social, and technological aspects influence the complex consumer behaviour found in the e-commerce industry.

Consumer preferences are greatly influenced by a number of factors, including price sensitivity, brand reputation, product quality, discounts, delivery services, and simple return policies. Digital platforms are changing how items are displayed as well as how customers engage with and view them thanks to the growth of influencer marketing, targeted ads, and AI-powered personalisation.

The success of e-commerce is still largely dependent on trust. Concerns about cybersecurity, fraudulent transactions, and data privacy continue to be major obstacles for many customers despite technical developments. By addressing these issues with safe payment methods, open regulations, and attentive customer support, we can greatly increase customer loyalty and trust.Additionally, social media's incorporation with e-commerce has given consumers' decision-making a new perspective. Instagram, Facebook, YouTube, and other platforms have developed into potent instruments where user-generated content, influencer endorsements, and peer evaluations significantly impact purchasing decisions. Because of these platforms, customers can verify goods and services from reliable sources, which makes digital marketing a crucial area of strategic focus for online merchants.

Another important element affecting customer decisions is convenience. Customer happiness and retention are greatly influenced by features like easy-to-use interfaces, a variety of payment alternatives, quick delivery choices, and simple return policies. In today's cutthroat digital market, companies that put an emphasis on seamless and simple user experiences have a better chance of succeeding.

In light of these dynamics, the purpose of this study is to investigate the major determinants of customer behaviour in the Indian e-commerce industry. The study looks at trust, digital marketing, social influences, and convenience in an effort to offer useful information to companies looking to improve their online visibility and better match their tactics with changing customer demands.

Literature Review

1. Debnath Burman and Dr. Artee Aggrawal (2020) Title: “Factors Affecting Buying Behavior in E-commerce in India: A Review of Literature” Summary: This study examines the changing buying behavior of Indian consumers, highlighting the roles of education, age, income, economic conditions, media, and technology in shaping online shopping habits.

2. Syed Meeran. A (2020) Title: “A Study on Consumer Behaviour Towards Online Shopping” Summary: This research explores consumer attitudes towards online shopping in India, discussing the evolution of business-to-consumer e-commerce and the factors influencing consumer preferences for online purchases.

3. Vivek Shrivastava (2023) Title: “Consumer Decision-Making in E-Commerce: A Literature Review of Factors Influencing Online Purchases”Summary: This paper consolidates and critically evaluates studies on consumer decision-making in e-commerce, providing insights into the key factors influencing online purchase behaviors.

4. Manasvi Tehanguria (2023) Title: “E-commerce Reshaping India: A Comprehensive Study on Consumer Behavior, Economic Impact, and Policy Implications”Summary: This study explores the evolving landscape of e-commerce in India, delving into consumer behavior, economic ramifications, and policy considerations, informed by a survey conducted across India.

5. Amoghsiddhi Urne (2020) Title: “Impact of E-Commerce on Consumer Buying Behaviour: A Review of Existing Literature”Summary: This paper reviews existing literature to understand the impact of e-commerce on consumer buying behavior in India, highlighting the role of youth consumers and technological advancements.

6. A. Kazmin (2024) Subject: "Pressures Mount in India's Delivery Market for Anything, Anytime" The competitive environment of India's quick-commerce industry is examined in this article, along with the pricing and logistical difficulties that large delivery services confront.

7. J. D’Silva (2024) The title is "Billionaire Ambani's Reliance Plays Catch-up to Ride India's Quick Commerce Wave "Reliance's introduction into the Indian rapid commerce market is highlighted in this report, along with the tactics employed to contend with well-established firms like Zepto, Swiggy, and Blinkit.

8. A. Pal (2025) The title is "Fast-Delivery Companies Zomato, Swiggy, Zepto Face India Antitrust Case Over Discounts" This study examines the ramifications for pricing strategies and consumer trust of India's ongoing antitrust investigations involving significant food delivery and e-commerce companies.

9. Research Department at Statista (2025) Subject: "Statistics about E-Commerce in India" With an emphasis on customer demographics, online purchasing trends, and technological impacts, this research provides statistical insights into the evolution of e-commerce in India.

10. In 2023, McKinsey & Company Subject: "E-commerce in India: Drivers and Challenges" In conclusion, this study offers a thorough examination of the elements influencing the uptake of e-commerce in India, as well as obstacles including digital payments, logistics, and legal restrictions.

11. In 2025, Weisman-Pitts, J. The title is "Consumer Behavior Trends in 2025: A Comprehensive Analysis"

The impact of mobile commerce and the changing buying patterns in India's expanding digital marketplace are the main topics of this paper, which looks at global trends in consumer behavior.

12. Insights on Speed Commerce (2025) Subject: "E-commerce in 2025: All The Stats & Trends for the US, Canada, India, Asia, Europe" In summary, this study compares the evolution of e-commerce globally, highlighting new consumer habits, digital payment integration, and India's explosive growth.

13. Business and Economic Management Research International Journal (2023) The title is "Factors Affecting Buying Behavior in E-commerce in India: A Qualitative Analysis"
In summary, this qualitative study examines how consumers behave in India's e-commerce sector, emphasizing important technological, social, and psychological aspects that affect buying choices.

14. Creative Research Thoughts International Journal (2023) The title is "Assessing Consumer Purchase Behavior in E-Commerce: A Survey-Based Approach" In summary, this study examines the factors that influence Indian consumers' online shopping experiences, their preferred payment methods, and their buying habits using survey data.

15. The 2024 Inspira Research Association Subject: "Trends and Patterns of Buying Behaviour Through E-commerce in India" In summary, this study looks at new consumer trends in Indian e-commerce, such as how social media marketing, brand reputation, and discounts affect purchasing decisions.

Objective

1. To investigate how trust and security influence consumer decision-making in online shopping.

2. To explore the role of digital marketing in shaping consumer purchasing behavior.

3. To evaluate the impact of convenience on customer satisfaction in e-commerce.

Research Methodology

Method used: Convenient sampling is the sample technique employed in this instance. The data is collected with the help of a Google forms questionnaire.

Sample size: Total 114 responses were received.

Sample universe: Students, Residence of Delhi NCR.

Sample Response: Google Forms- 114 respondents.

Nature of the research: This research uses a descriptive and analytical approach. Accuracy is the main objective of descriptive and analytical investigations.

Tools for analysis: Bar diagrams, percentage analysis, pie charts, and tabular data representation are the analysis techniques used in the study.

Analysis

1. The majority of participants (62.6%) were aged between 18 and 25, showing that younger individuals are the most active in online shopping.

2. Most respondents were students, highlighting the influence of educational background and age on digital purchasing behavior.

3. Amazon and Flipkart emerged as the top choices for online shopping among participants, indicating their strong presence in India's e-commerce space.

4. Over half of the respondents (52.6%) reported that price discounts heavily affect their decisions to buy products online.

5. Nearly 46.5% of participants mentioned that they consider product reviews essential before making a purchase.

6. About 42.1% of users had faced issues like receiving faulty or incorrect items, underlining the importance of building customer trust.

7. Despite the growth in digital payments, 34.2% still preferred cash on delivery, reflecting ongoing concerns about online transaction safety.

8. Social media platforms such as Instagram, YouTube, and Facebook were seen as major influences, shaping purchasing habits through reviews and promotions.

9. Many participants expressed dissatisfaction with extra charges, poor-quality items, and complex return procedures.

10. Users favored platforms that offered features like easy navigation, fast delivery, and simple return policies, which directly impact customer loyalty.

11. Tailored recommendations and personalized product suggestions were found to enhance user interest and satisfaction.

12. Secure and reliable payment systems were viewed as critical for encouraging repeat customers.

13. Many users preferred UPI and wallet-based payments, showing an increasing shift toward cashless transactions.

14. A brand's reputation influenced purchasing choices, especially in categories like electronics, clothing, and gadgets.

15. Easy access to return and exchange services was considered an important feature when choosing an online platform.

16. Participants appreciated platforms that provided suggestions based on their past browsing and purchase history.

17. Recommendations from friends or social circles played a strong role in decision-making, especially among the younger audience.

18. Fast and helpful customer support was linked to improved satisfaction and platform reliability.

19. A smooth and user-friendly mobile app experience was crucial, with users preferring quick loading times and easy checkouts.

20. The study highlights that e-commerce platforms must focus on interface design, service quality, and customer-oriented policies to maintain a competitive edge.

Findings

1. Online shopping is most popular among younger consumers, as evidenced by the fact that the majority of respondents are students (64.9%) and young adults (70.2%).

2. Market Leaders: Amazon (65.8%) and Flipkart (60.5%) are the most popular platforms, but Myntra is becoming more popular for fashion purchases.

3. Reviews and Discounts Are Most Important: 46.5% of consumers base their purchasing decisions on product reviews, while 52.6% give priority to discounts.

4. Cash on Delivery (COD) Remains Popular: COD (37.7%) is still utilized extensively despite digital payments, indicating problems with online transaction trust.

5. Social Media Has a Moderate Impact: 25.4% of respondents believe social media has a significant influence on their decisions, compared to 39.5% who say it influences them.

6. Fraud and Subpar Products Are Serious Issues: 52.6% experience quality problems and 42.1% have been defrauded, which undermines confidence in internet buying.

7. The majority of shoppers desire monthly purchases: The majority (43.9%) only shop once a month, suggesting a regular but not daily reliance on online shopping.

8. Future Growth in Online Shopping: 37.7% of consumers intend to increase their frequency of online shopping regardless, while 46.5% say they will purchase more if better prices become available.

Conclusion

The study on Indian e-commerce consumer behavior identifies important variables that affect consumers' decisions to shop online. The results show that, with a balanced gender distribution, young consumers (18–25 years old) make up the largest section of internet shoppers. Due to their limited financial resources, the majority of responders are price-sensitive and heavily swayed by sales and discounts.

Myntra is well-positioned in the apparel sector, but Amazon and Flipkart control the majority of the market. The most popular category is still clothing, which is followed by electronics and cosmetics. Although UPI has become the most popular payment option, many customers still prefer Cash on Delivery (COD), which is indicative of their mistrust of online purchases.

Customer reviews and ratings have a significant influence on consumer decisions; 68.4% of consumers believe they are essential before making a purchase. However, problems like expensive delivery fees, subpar products, and return/refund policies still lead to customer dissatisfaction and 50% of shoppers abandon their carts. Furthermore, with 42.1% of respondents reporting some kind of fraud, data privacy and online scams continue to be top concerns.

Purchases are moderately to significantly influenced by social media, especially for younger consumers. Many customers are still hesitant to spend more money on premium services, even though some are willing to pay more for quicker delivery. According to the study, better offers, increased security, and increased service dependability are key factors in the future growth of e-commerce in India.

In conclusion, the main factors influencing consumer choices in Indian e-commerce are price sensitivity, trust, convenience, and product quality. To keep and grow their customer base, businesses must concentrate on providing competitive pricing, earning the trust of their clients, making sure that return policies are easy to follow, and enhancing the quality of their services. Companies must constantly adjust to meet customer expectations and maintain their competitive edge in this dynamic market due to changing consumer preferences and the increasing impact of digital marketing.

References

Chaffey (2022). Digital marketing: Practice, Strategy, and Execution (8th ed.). Pearson.

Deloitte (2023). Driving inclusive growth in digital commerce is the future of e-commerce in India. insights from Deloitte. Deloitte's website on the internet

Arora, N., and S. Gupta (2021). An analysis of the factors that influence e-commerce consumer purchasing behavior. Business Research Journal, 130, 558-569. 10.1016/j.jbusres.2021.08.012 https://doi.org

Dange, U., and Kumar, V. (2020). Social media marketing's effect on customers' purchasing decisions. Journal of Marketing Studies International, 12(3), 45-56. ijms.v12n3p45 https://doi.org/10.5539

2023; McKinsey & Company. India's digital consumer trends: A look at how e-commerce is changing. Global Institute of McKinsey. This link: https://www.mckinsey.com

J. Nielsen (2021). Consumer behavior and trust in online shopping trends in emerging markets. 38(2), 234-250, Journal of Consumer Marketing. JCM-05-2021-4108 https://doi.org/10.1108

Sharma, R., and Rai, A. (2022). A thorough review of the literature on the subject of trust in online shopping. Research and Applications in Electronic Commerce, 55, 101-118. 10.1016/j.elerap.2022.101118 https://doi.org

Statista, 2024. India's e-commerce market: Forecasts and growth trends. You can access Statista.com.

CLIMATE CHANGE POLICIES: ALIGNING GLOBAL AND LOCAL EFFORTS

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Abstract

The complicated and multifaceted issue of climate change necessitates coordinated global, national, and local action. Although global frameworks like the Paris Agreement and the United Nations Framework Convention on Climate Change (UNFCCC) offer the general framework for climate governance, national and local governments play a major role in its successful execution. Using multilevel and polycentric governance theories to examine the relationship between international commitments and grassroots initiatives, this study examines the theoretical and practical aspects of coordinating global climate change policies with local initiatives.

The function of Nationally Determined Contributions (NDCs) and their operationalization through regional climate action plans are both critically examined in this paper. It also examines issues that impede cogent policy integration, such as governance asymmetries, resource imbalances, and institutional fragmentation. The study also explores, through a theoretical lens, the possibility of harmonizing climate plans through knowledge exchange, participatory governance, and flexible policy frameworks that take into account various environmental and socioeconomic conditions.

In order to improve climate resilience, this study emphasizes the significance of integrating indigenous knowledge systems, empowering sub-national actors, and promoting policy coherence. It comes to the conclusion that in addition to structural alignment, normative changes toward inclusivity, transparency, and justice are necessary to close the gap between local reality and global aspirations. The report makes suggestions for creating flexible, cooperative, and multi-level strategies that can improve climate governance and guarantee more sustainable and equitable results.

Keywords- Climate governance, Multilevel policy alignment, Climate resilience, Local climate action, Policy coherence

Introduction

Many people agree that one of the most important worldwide issues of the twenty-first century is climate change, which has profound effects on ecosystems, economics, and human society. Rising temperatures, changed precipitation patterns, extreme weather events, and sea level rise are some of the local effects of climate change, even if its causes and effects are global in scope. Therefore, combating climate change necessitates a coordinated strategy that closes the gap between international policy frameworks and regional implementation plans.

International efforts over the past few decades have resulted in significant policy tools including the Paris Agreement and the Kyoto Protocol, especially under the United Nations Framework Convention on Climate Change (UNFCCC). These accords place a strong emphasis on justice, shared responsibility, and the necessity of national contributions to the worldwide reduction of emissions. However, the ability of national and sub-national actors to convert general promises into specific measures appropriate for particular local settings is ultimately what determines whether such frameworks are successful.

The theoretical and policy-based strategies for coordinating local implementation initiatives with global climate targets are examined in this research. In order to comprehend how coordination, coherence, and communication across scales can be accomplished, it makes use of multilevel and polycentric governance theories. By doing this, the study draws attention to the difficulties and possibilities involved in creating strong connections between global climate goals and regional development Plans.

The study also discusses how communities, civil society, and local governments are important players in climate adaptation and mitigation. This article looks at institutional capacity, policy integration, and participatory techniques in an effort to add to the larger conversation on climate governance. In the end, it makes the case for a flexible, inclusive, and context-aware policy framework that fosters alignment between local realities and global aspirations.

Theoretical Framework

This study uses four interconnected theoretical perspectives—Multilevel Governance Theory, Polycentric Governance Theory, Climate Justice Framework, and Policy Coherence Theory—to examine the intricate and multi-layered dynamics involved in coordinating local activities with global climate change policies. When combined, these frameworks offer a thorough perspective through which to view the relationships, conflicts, and collaborations between different institutions and actors at different levels of government.

Multilevel Governance Theory- Understanding the allocation of power and policy duties among international, national, regional, and local players is made easier with the help of multilevel governance theory. This theory sheds light on how national and subnational organizations must transform global policy decisions—such as those made by the Paris Agreement or the United Nations Framework Convention on Climate Change (UNFCCC)—into actionable steps. It helps to explain both collaboration and conflict across governance levels by highlighting the significance of both vertical and horizontal coordination in the creation and implementation of policies.

Polycentric Governance Theory- This is enhanced by Polycentric Governance Theory, which refocuses attention on the existence of several, partially independent centers of decision-making that overlap. In addition to national governments, city networks, non-governmental groups, and transnational coalitions are increasingly influencing climate governance. According to polycentric theory, which places an emphasis on creativity, learning, and flexibility, dispersed actors can both contribute to larger policy objectives and more successfully address local climate concerns.

The Climate Justice Framework- By emphasizing concerns of justice, equity, and accountability, the Climate Justice Framework adds an ethical component to climate governance. It looks at how, in spite of their small part in starting the issue, disadvantaged populations—often in the Global South—are disproportionately impacted by climate change. This paradigm opposes top-down policy approaches and advocates for inclusive, participatory procedures that encourage equitable transitions, particularly at the local level, and acknowledge differentiated responsibilities.

Policy Coherence Theory- The significance of policy alignment and consistency across sectors and scales is emphasized by policy coherence theory. When development priorities, land use regulations, or economic plans clash with climate aims, incoherence in climate governance may result. This idea aids in locating inconsistencies, overlaps, and gaps that could compromise the efficacy of climate action. Additionally, it encourages the creation of integrative policy strategies that guarantee alignments between local demands and global obligations.

These four theoretical frameworks, when combined, provide a strong analytical basis for investigating the ways in which global climate policy can be effectively localized. In order to create a climate governance architecture that is robust, inclusive, and effective, they stress the importance of distributive equality, cross-level discussion, institutional integration, and consistent policy alignment.

Global Climate Policy Architecture

Decades of international debates, institutional advancements, and collaborative processes have shaped the architecture of global climate policy in order to tackle the intricate problem of climate change. This architecture, which is mainly based on the United Nations Framework Convention on Climate Change (UNFCCC), creates a multilateral framework that directs group initiatives to reduce greenhouse gas emissions and prepare for the effects of climate change.

International climate governance was established in 1992 with the adoption of the UNFCCC at the Rio Earth Summit. Common but differentiated responsibilities and respective capabilities (CBDR-RC), which acknowledges the historical emissions and disparities in capacities of wealthy and developing nations, is one of the fundamental concepts it introduced. Though its limited involvement and lack of pledges from emerging economies resulted in mixed results, the Kyoto Protocol (1997) was the first legally binding pact with measurable emission reduction objectives for wealthy nations.

The 2015 approval of the Paris Agreement marked a dramatic change. It is a non-binding, bottom-up structure that depends on Nationally Determined Contributions (NDCs), in which nations voluntarily commit to their climate targets, in contrast to its predecessor. The Paris Agreement, which aims to keep the rise in global temperatures far below 2°C, with efforts to keep it to 1.5°C, places a strong emphasis on transparency, international stocktaking, and financial support.

Apart from these fundamental accords, the global climate architecture encompasses auxiliary mechanisms like the Green Climate Fund (GCF), assessments conducted by the Intergovernmental Panel on Climate Change (IPCC), and worldwide projects like the Loss and Damage Fund. In the governance of the global climate, non-state actors—such as civil society coalitions and city networks like C40 Cities—are also becoming more and more important. Notwithstanding its successes, the global architecture still confronts problems like low ambition, sluggish implementation, and a misalignment between global pledges and local realities. This study aims to solve these problems by using the multilevel policy alignment lens.

National and Local Climate Policies

In order to convert international climate pledges into domestic initiatives, national governments are essential. They serve as go-betweens, incorporating global climate accords like the Paris Agreement into domestic policy plans. In this context, the formulation and execution of Nationally Determined Contributions (NDCs), which represent each nation's goals for climate adaptation and mitigation, are crucial. NDCs provide a tangible foundation for both domestic and international accountability by outlining national emissions reduction targets, climate adaption strategies, and financial obligations.

However, trying to integrate national policy with global climate objectives frequently presents difficulties. The disparity in national priorities is one major problem. In many nations, other urgent issues like energy security, poverty reduction, and economic development contend with climate change. For example, in underdeveloped countries, economic expansion and energy poverty often take precedence over environmental goals, resulting in less aggressive or slower climate action. On the other hand, strict climate policies may encounter domestic political opposition in some developed nations, particularly when they call for the decarbonization of heavy sectors or the switch to renewable energy.

Cities and municipalities are becoming more and more acknowledged as key actors in local climate action. Many local governments have created ambitious climate action plans that target particular local risks because they frequently have a greater direct impact on the populations they serve. Urban heat islands, flood control, green infrastructure, energy efficiency, and sustainable transportation are among the topics that local climate policies usually address. Green building regulations, improved public transit, and urban greening initiatives are just a few examples of initiatives that can drastically cut emissions and boost climate effect resilience.

The bulk of the world's population lives in metropolitan regions, where municipal governments play a crucial role. Since they are in charge of handling the effects of climate change, such as heat waves and flooding, local governments play a crucial role in putting adaptation plans into action. Additionally, towns frequently act as innovation labs, testing out novel approaches to climate problems that may eventually be expanded to the national or international level.

Despite its significance, local governments frequently struggle to match their policies with national and international frameworks due to a lack of funding, technical know-how, and authority. Mechanisms for cooperation between local, national, and international players are crucial to closing these gaps. In certain instances, cities have participated in international policy talks through city networks and alliances, while national governments have supported local action with finance, technical aid, and policy direction.

Challenges in Aligning Global and Local Efforts

Effective implementation of climate goals is hampered by a number of major obstacles that must be overcome in order to align global climate change policy with local activities. These difficulties result from variations in governance frameworks, institutional capabilities, and socioeconomic settings among various governmental tiers and regions.

1. **Institutional Fragmentation and Jurisdictional Conflicts-** Institutional fragmentation is a major barrier to coordinating local and global climate actions. The governance of climate change encompasses a number of industries, including energy, transportation, agriculture, water, and urban planning, all of which are frequently overseen by distinct governmental entities at different levels. Conflicting policies, ambiguous roles, and ineffective resource allocation might result from this fragmentation. Since responsibilities for climate action are sometimes unclear or dispersed, jurisdictional disputes between municipal, regional, and federal governments make it even more difficult to implement coherent climate programs.
2. **Resource Asymmetries-** The inequality of resources across nations, regions, and cities is a major obstacle to local climate action. Many developing nations confront significant obstacles, even while wealthier nations may possess the institutional, financial, and technological means to carry out ambitious climate plans. These include a lack of infrastructure to assist attempts at climate adaptation and mitigation, limited access to climate finance, and a lack of technical skills. In a similar vein, rural or smaller towns within nations frequently lack the financial and technical

resources necessary to implement climate policies that are in line with international or national frameworks.

3. **Political and Economic Priorities-** Local and national governments may have conflicting economic and political agendas. For instance, in underdeveloped countries, short-term issues like poverty alleviation, economic expansion, and access to essential services usually trump long-term climate action. Political resistance to climate measures, especially those involving economic transitions like industry decarbonization or changes in energy output, can make it difficult to carry out international obligations locally in developed nations.
4. **Public Awareness and Engagement-** Widespread public participation and support are necessary for effective climate action. Local communities might not, however, completely comprehend the gravity of climate change on a global scale or how their activities relate to global objectives. For policy alignment to be successful, increasing knowledge and encouraging involvement at all societal levels continue to be crucial obstacles.

Opportunities for Synergy

Although coordinating local and global climate policies presents many obstacles, there are also plenty of chances for collaboration that can improve climate action at all scales. These opportunities promote creative, inclusive responses to climate change while also enhancing the coherence of local and global initiatives.

1. Co-creation of Policy through Stakeholder Engagement- Co-creating policies that actively involve a wide range of stakeholders, such as local governments, corporations, civil society organizations, and communities, is one of the best methods to coordinate global and local activities. Early stakeholder engagement in the policy-making process increases ownership, makes climate policies more relevant, and guarantees that local needs and expertise are integrated into larger frameworks. Participatory climate action plans, for instance, that include local communities in decision-making procedures can improve the efficacy of policies and encourage sustained implementation commitment.

2. Localization of Sustainable Development Goals (SDGs)- The United Nations adopted the Sustainable Development Goals (SDGs), which provide a framework for tackling global issues including climate change. Cities and municipalities can customize the SDGs to fit their unique circumstances by localizing them. This strategy aids in bridging the gap between significant local initiatives and high-level international accords. For instance, coordinating local policies pertaining to energy efficiency, urban resilience, and disaster preparedness with SDG 13 (Climate Action) guarantees that global goals are fulfilled while taking into account the particular difficulties that local communities face.

3. Climate Finance Mechanisms Supporting Local Innovation- To close the gap between local reality and global aspirations, financial support is essential. Bilateral funding agreements or climate finance instruments like the Green Climate Fund (GCF) can supply much-needed cash for regional climate innovation. These grants allow local governments and communities to carry out projects including disaster risk reduction programs, sustainable agriculture practices, and the adoption of renewable energy that are in line with national and international climate goals. In turn, local governments can use global climate money to expand solutions that have been shown to be effective in their particular environments.

4. Integrating Indigenous Knowledge and Community-Based Adaptation into National Plans- Incorporating community-based adaptation and indigenous knowledge into national climate plans presents another encouraging chance for collaboration. Because of their customs and practices, indigenous peoples and local communities frequently have important insights into climate resilience, adaptation tactics, and sustainable land management. Policies can be made more egalitarian, effective, and context-sensitive by integrating this knowledge into national and international climate agendas. Aligning international commitments with locally based solutions can be facilitated by acknowledging the role of indigenous populations in conservation and adaptation.

Case Examples (Theoretical Lens)

It is instructive to look at how many nations and towns have handled the challenging landscape of multilevel climate governance in order to comprehend how international climate pledges might be matched with local efforts. We examine the lessons from city networks and climate agreements like the Global Covenant of Mayors, as well as the experiences of Germany, India, and Kenya, via a theoretical perspective.

1. Germany: A Model of Multilevel Coordination- When it comes to coordinating local efforts with national climate legislation, Germany has taken the lead. Multilevel governance is exemplified by the nation's Energiewende (energy transition) program, which seeks to phase out nuclear energy and lower carbon emissions by switching to renewable energy sources. Under the Paris Agreement, Germany has set aggressive national goals, such as reducing greenhouse gas emissions by 55% from 1990 levels by 2030. In particular, by encouraging energy efficiency and renewable energy initiatives at the municipal level, local governments play a crucial role in reaching these goals. In order to ensure compatibility with national and international goals, local authorities have been encouraged to create and carry out their own sustainability programs under the German Local Agenda 21 project. This approach exemplifies **multilevel governance theory**, where coordination between different levels of government fosters policy coherence.

2. India: Integrating Global Commitments with Local Development Needs- India's experience serves as an example of the opportunities and difficulties involved in coordinating international climate pledges with local and national requirements, particularly when considering development goals. India committed to lowering its carbon intensity, or emissions per GDP unit, by 33–35% by 2030 compared to 2005 levels under the terms of the Paris Agreement. The National Action Plan on Climate Change (NAPCC) offers a framework for putting mitigation and adaptation plans for climate change into practice locally. The difficulty, therefore, is striking a balance between these climatic objectives and India's fast economic expansion as well as the demands of poverty alleviation, energy access, and infrastructure development. By concentrating on risks unique to a certain region, such as flooding in coastal areas or droughts in the northwest, local governments play a critical role in localizing adaptation methods. . India's experience demonstrates the tension between **policy coherence theory** and **climate justice**, as equity and fairness need to be embedded in climate policies that support both development and climate resilience.

3. Kenya: Community-Based Adaptation and Indigenous Knowledge- Kenya serves as an illustration of how indigenous knowledge and community-based adaptation can improve the fit between international commitments and local realities. Local communities in Kenya have played a significant role in climate adaptation initiatives, especially in rural areas that are susceptible to floods and droughts. The Kenya National Climate Change Response Strategy encourages the incorporation of indigenous knowledge into national policies, including the application of agroecological farming practices and traditional water conservation strategies. The promise of polycentric governance theory, where local solutions contribute to larger global aims, is shown by this connection of local practices with global frameworks, such as the Paris Agreement.

4. Lessons from City Networks and Climate Pacts- Cities may cooperate together on climate action through city networks like the Global Covenant of Mayors, which exchange best practices and coordinate regional initiatives with international climate goals. With an emphasis on cutting emissions, encouraging sustainable urban mobility, and improving energy efficiency, cities like Copenhagen and New York have put ambitious climate action plans into motion. These city networks are prime examples of polycentric governance, in which cities serve as important hubs for climate governance decision-making and test out novel, scalable, and regionally adaptable solutions.

Policy Recommendations

Creating plans that encourage collaboration, creativity, and inclusivity at all governmental levels is essential to successfully coordinating international climate change policy with regional initiatives. The necessity of integrative planning, capacity-building, decentralized innovation, and strong feedback systems are the main topics of the following policy proposals.

1. Promote Integrative Planning Mechanisms and Institutional Coordination- The disarray of climate governance across industries and governmental levels is a major obstacle to coordinating local and global climate strategies. Promoting integrative planning techniques that make it easier for local, national, and international actors to coordinate is crucial to overcoming this. Establishing cross-sectoral task forces, inter-agency working groups, and joint climate action committees that include pertinent stakeholders such as local communities, corporations, civil society, and government agencies might help achieve this. By ensuring that climate policies are both contextually relevant and coherent, these tools can promote policy alignment at all levels of governance. Furthermore, to guarantee that climate action is in line with other development priorities like social fairness, economic growth, and health, there must be robust institutional coordination at the national level.

2. Support Capacity-Building and Knowledge Exchange Platforms- In order for local governments to successfully carry out the global climate targets, it is imperative that they improve capacity-building and establish knowledge-sharing platforms. Lack of funding, technical know-how, and access to climate data frequently provide difficulties for local governments in underdeveloped nations. Governments and international organizations need to fund capacity-building initiatives that teach communities, planners, and local officials how to adapt to and mitigate the effects of climate change. Furthermore, establishing platforms for knowledge exchange—like online networks, international conferences, and regional climate hubs—can help nations and localities share best practices, technical advancements, and policy instruments. Cities, towns, and even nations can adopt climate solutions that have been successfully applied elsewhere more quickly if peer-to-peer learning is encouraged.

3. Incentivize Policy Experimentation and Decentralized Innovation- Governments should encourage policy experimentation and support decentralized solutions to climate concerns in order to promote local ownership and innovation. Local governments are frequently in a better position to test out climate policies that are suited to particular geographic settings. Policy laboratories that offer financial and technical assistance to local governments experimenting with novel climate solutions can be established by national governments. These experiments should be viewed as chances to learn and scale effective strategies, supporting a bottom-up approach to climate change, regardless of whether they are in the areas of sustainable energy, urban planning, or catastrophe resilience.

4. Establish Feedback Mechanisms for Monitoring and Learning- Last but not least, maintaining the alignment and adaptability of local and global initiatives depends on efficient monitoring and learning. Finding gaps, achievements, and areas for improvement in climate policy can be facilitated by putting in place strong feedback systems that evaluate their development on a regular basis. To measure the effects of local climate initiatives, such methods should incorporate citizen participation, participatory monitoring, and data gathering tools. Climate policies will continue to be adaptable and responsive to new issues and evolving conditions thanks to regular reviews and adaptive learning procedures.

Conclusion

The theoretical importance of multilevel and polycentric governance is emphasized in this research as crucial frameworks for coordinating local initiatives with international climate policies. A coordinated strategy at all levels of governance—from international agreements to local initiatives—is required due to the complexity of climate change. Understanding how national, regional, and local governments collaborate to carry out international climate pledges is made easier with the help of multilevel governance theory. By highlighting the significance of overlapping decision-making centers, polycentric governance theory, on the other hand, enables decentralized, situation-specific solutions that support global objectives. The dynamic, multi-layered character of climate governance and the necessity of strong cooperation between international, national, and local players are demonstrated by these ideas taken together.

But coordinating local and global climate strategies is an ethical problem as much as a technical one. The case studies and policy proposals emphasize how important it is for climate action frameworks to be inclusive, equitable, and coherent. Despite their importance, global commitments need to be locally contextualized in order to address the distinct vulnerabilities, capacities, and objectives of communities worldwide. In order to prevent vulnerable populations, especially those in the Global South, from bearing an unfairly disproportionate amount of the burden of climate action, climate justice must continue to be a fundamental component of climate policy.

Additionally, policy coherence is essential to preventing contradictory policies in sectors like infrastructure, development, and energy from undermining climate initiatives. This essay promotes an all-encompassing, integrated strategy for climate governance that prioritizes justice, cooperation, and local expertise.

To sum up, coordinating local and global climate activities necessitates a coordinated, multi-level strategy that prioritizes bottom-up ideas as well as top-down pledges to make sure that climate policies are equitable and successful for everyone.

References

- Agrawal, A. (2005). **Environmentality: Community, intimacy, and nature.** Oxford University Press.
- Biesbroek, R., Swart, R., & van der Knaap, W. (2009). **The mitigation-adaptation dichotomy and the role of spatial planning.** Environmental Science & Policy, 12(7), 1012-1020. https://doi.org/10.1016/j.envsci.2009.07.002

- Bulkeley, H., & Betsill, M. (2005). **Rethinking sustainable cities: Multilevel governance and the 'urban' politics of climate change.** Environmental Politics, 14(1), 42-63. https://doi.org/10.1080/0964401042000310178
- De Lange, M., & van der Windt, H. (2017). **Climate governance and the role of cities: Exploring the connections between urban sustainability and climate change mitigation.** Environmental Politics, 26(6), 1079-1099. https://doi.org/10.1080/09644016.2017.1354202
- Duit, A., & Galaz, V. (2008). **Governance and complexity—emerging issues for governance theory.** Governance, 21(3), 311-335. https://doi.org/10.1111/j.1468-0491.2008.00423.x
- German Advisory Council on Global Change. (2017). **A world in transition: Governance and the transformation of societies.** WBGU Report 2017. http://www.wbgu.de/en/
- Giddens, A. (2009). **The politics of climate change.** Polity Press.
- Hale, T. (2016). **All hands on deck? The governance of climate change through polycentric networks.** Global Environmental Politics, 16(4), 1-17. https://doi.org/10.1162/GLEP_a_00382
- Hoppe, T., Wesselink, A., & de Lange, R. (2013). **The role of local governments in climate change adaptation.** Environmental Science & Policy, 31, 179-191. https://doi.org/10.1016/j.envsci.2013.03.004
- IPCC. (2014). **Climate Change 2014: Mitigation of Climate Change.** Cambridge University Press. https://www.ipcc.ch/report/ar5/wg3/
- Jänicke, M., & Weidner, H. (2014). **The political economy of climate policy: A comparison of the United States, the European Union, and China.** Climate Policy, 14(4), 415-434. https://doi.org/10.1080/14693062.2014.896049
- Keohane, R. O., & Victor, D. G. (2011). **The regime complex for climate change.** Perspectives on Politics, 9(1), 7-23. https://doi.org/10.1017/S1537592710004068
- KfW Bankengruppe. (2018). **The role of finance in accelerating local climate action.** KfW Development Bank Report. https://www.kfw-entwicklungsbank.de/EN_Home/
- Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). **Overcoming the tragedy of super wicked problems: Confronting climate change through the polycentric governance approach.** Global Environmental Change, 22(2), 170-179. https://doi.org/10.1016/j.gloenvcha.2011.12.003
- Meuleman, L. (2015). **Public management and the transition to sustainability: Theoretical and practical perspectives.** Springer. https://doi.org/10.1007/978-3-319-19063-4
- Newig, J., & Fritsch, O. (2009). **Environmental governance: Participatory, multi-level, and polycentric.** Environmental Policy and Governance, 19(3), 197-214. https://doi.org/10.1002/eet.510
- Ostrom, E. (2010). **Polycentric systems for coping with collective action and global environmental change.** Global Environmental Change, 20(4), 550-557. https://doi.org/10.1016/j.gloenvcha.2010.07.004
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., … & Foley, J. A. (2009). **A safe operating space for humanity.** Nature, 461, 472-475. https://doi.org/10.1038/461472a
- Satterthwaite, D. (2008). **Climate change and urbanization: Effects and implications for urban governance.** Environment and Urbanization, 20(2), 539-554. https://doi.org/10.1177/0956247808096122

TO ASSESS THE LEVEL OF FINANCIAL LITERACY AWARENESS AMONG COLLEGE STUDENTS IN DELHI/NCR

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Abstract

This study aims to comprehensively evaluate the level of financial literacy awareness among 99 college students in the Delhi/NCR region, an age group increasingly exposed to financial responsibilities and decision-making. As financial markets become more sophisticated and digital tools more prevalent, the ability to understand and manage personal finances has become a vital life skill. The research adopts a mixed-method approach using structured questionnaires and analytical tools like SPSS, NVivo 12, and Excel to assess three core dimensions of financial literacy: knowledge, attitude, and behavior.

The findings indicate that while students show a reasonable understanding of basic financial operations—such as banking, saving, and budgeting—they lack familiarity with advanced concepts like investments, credit scores, insurance, and risk management. The gap between theoretical knowledge and real-life financial behavior is evident, with many students failing to maintain consistent saving habits, track expenses, or plan investments. Students from commerce backgrounds and those who have attended financial literacy workshops demonstrate relatively higher competence.

Furthermore, the widespread use of digital financial platforms is not matched by sufficient awareness of cybersecurity risks. The study recommends integrating financial education into college curricula, organizing workshops, and increasing policy-level interventions to cultivate responsible financial behavior and long-term financial well-being among youth.

Keywords: Financial knowledge, financial attitude, financial behavior, budgeting.

Introduction

Financial literacy is the ability to understand and effectively use various financial skills, including personal financial management, budgeting, and investing. When you are financially liberate, you have the foundation of a relationship with money, and it is a lifelong journey of learning. The earlier you start, the better off you will be, because education is the key to success and it comes to money

.Being financially literate refers to having the capacity to make wise decisions about the use and management of money. A person's abilities, knowledge, attitudes, and and finally their behaviors in respect to money make up their financial literacy, People with financial literacy skills are better equipped to understand the financial system, manage their money wisely, and reduce the likelihood of being Deceived when it comes to money .Financial literacy is the use of information and skills to effectively manage financial resources.

In a person's life for their financial security, wellbeing. The level of financial literacy of a person affect their capacity to make wise financial decisions, such as saving, funding, budgeting and planning. Individuals who possess the financial literacy abilities are better able to manage their money and reduce the likelihood of investment and spending related risks. Everyone needs have a basic understanding of finance in order to achieve financial well-being . Managing one's financial demands will be made easier for people if they acquire financial knowledge from diverse sources.

In the current environment, it is crucial for college students to acquire financial knowledge in addition to topic knowledge because they also have a lot more leeway when it comes to their spending choice. Both industrialized and developing nations have grown more worried over the past 20 years about their populations' level of financial literacy and awareness, especially among young people. Students who develop financial literacy will be better able to handle their money related problems. It can assist individuals in making financial plans, properly managing their finances, conserving money, etc.

Particularly young individuals must comprehend the fundamentals of investing, long-term planning, the differences between short- and long-term investments, the relationship between risk and return, and the effects of inadequate retirement planning. The requirement for financial literacy is unavoidable in the modem world, which has a market with complete products. In a nation like India, where there are many young people, it is crucial for the government to raise financial literacy. With the financial markets being deregulated, credit becoming more readily available, financial institutions fiercely competing with one another for market share, the development and marketing of financial products expanding quickly, and the government encouraging people to take more control over their retirement incomes, the need for financial literacy has grown significantly.

Understanding interest calculations, the connections between inflation and return, inflation and prices, risk and return, and the significance of diversification in risk management are all examples of financial knowledge. The individual's handling of money is evaluated by their financial behaviors. It entails paying bills on time, creating and maintaining adequate budgets budgets, developing consistent saving habits, etc. The individual's Behavior is influenced by their financial attitude. The belief f in planning, the desire to save money, and the level of consumption are all examples of an individual's financial attitude. Therefore, an individual's level of financial literacy is determined by a person's combination of financial knowledge, attitude, and Behavior.

The financial markets being deregulated, credit becoming more readily available, financial institutions fiercely competing with one another for market share, the development and marketing of financial products expanding quickly, and the government encouraging people to take more control over their retirement incomes, the need for financial.

As a college student, developing a basic understanding of financial concepts and practices is a essential life skill that can have a significant impact on your future financial well- being. By learning about topics such as budgeting, saving, investing, and credit, you can make informed decisions that will help you manage your money more effectively. Budgeting is the process of creating a plan for how you will allocate your income to cover your expenses. It involves identifying your income sources, tracking your expenses, and making adjustments as needed to ensure that you are living within your means.

Saving involves setting aside money for future needs or goals. This can include creating an emergency fund, saving for a down payment on a car or a home, or planning for retirement. Investing involves using your money to purchase assets with the goal of generating income or appreciation over time. This can include investing in stocks, bonds, mutual funds, or real estate. products. In a nation like India, where there are many young people, it is crucial for the government to raise financial literacy. With the financial markets being deregulated, credit becoming more readily available, financial institutions fiercely competing with one another for market share, the development and marketing of financial products expanding quickly, and the government encouraging people to take more control over their retirement incomes, the need for financial literacy has grown significantly.

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Credit involves borrowing money from a lender, with the expectation that you will repay the loan over time. This can include using credit cards, taking out student loans, or obtaining a mortgage. By developing a basic understanding of these financial concepts and practices, you can take control of your finances and make informed decisions that will help you achieve your financial goals.

Important Key Terms

Financial Literacy: Measuring Financial Literacy essentially involves measuring a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being. Financial Knowledge: Financial Knowledge is an important component of financial literacy, necessary for undertaking activities such as following news about the economy and financial landscape, comparing financial products and services and making appropriate, well-informed financial decisions.

Financial Behaviour: Financial Behaviour implies actions and conduct of consumers that ultimately shape their financial well-being in both short and longer-term. Some types of behaviour, such as putting off bill payments, choosing financial products without shopping around or using credit to make up a shortfall in income may impact negatively on the financial situation of individuals and their financial well-being. On the other hand, habitual conduct such as thinking before making a purchase, paying bills on time, budgeting, saving, are examples of positive types of behaviour for financial control.

Financial Attitude: Financial Attitude is defined as that outlook or mental disposition of consumers which, despite their adequate knowledge and ability to act in a particular way, influences their decision whether or not to act that way. It involves an instinctive nature of individuals to regard personal satisfaction or ideas of living style as more compulsive than other considerations. **Financial Well-being:** Financially literate individuals are better prepared to handle unexpected financial challenges and emergencies. They can develop strategies for financial resilience, manage financial shocks, and avoid excessive debt or financial stress. To address the importance of financial literacy, the OECD encourages governments, policymakers, educational institutions, and financial service providers to collaborate and develop comprehensive financial education strategies.

Factors Influencing Financial Literacy

- **Parental influence**: Parents' financial literacy levels have a significant impact on their children's financial knowledge.

- **Academic curriculum:** The inclusion of financial literacy education in the academic curriculum can improve students' financial knowledge and skills.

- **Extracurricular activities:** Participation in extracurricular activities that focus on financial literacy can enhance students' financial understanding.

- Financial literacy programs: Access to financial literacy programs and workshops can provide students with valuable financial education.These factors impact an individual level of financial literacy.

Objectives:

To study the level of awareness of financial literacy among the college students. To identify the need to educate college students about financial literacy.

Literature Review

1. Correa et al.(2025) This systematic literature review analyzed recurring factors related to young university students' financial education across 44 datasets using PRISMA guidelines. It identified two dominant themes—financial behavior and knowledge—as critical components shaping personal finance skills among youth today.

2. Kusumavati et al. (2024) This study examined how locus of control, lifestyle, financial literacy, and attitudes influence university students' financial management behavior in Yogyakarta using SEM analysis with SmartPLS3 software. It revealed that all four factors significantly impact students' ability to manage finances effectively. The findings emphasize the importance of integrating these elements into educational frameworks to improve overall financial management practices.

3. Soepriadi (2024) Soepriadi's 2024 study explores the impact of financial literacy on improving financial decision-making among students in Ambon City. The research aims to assess the level of financial literacy and its influence on financial behavior and decision-making processes. This study is particularly significant as it focuses on a specific urban context in Indonesia, providing insights into financial literacy in developing economies. The methodology likely involves surveys or questionnaires to gather data on students' financial knowledge, attitudes, and behaviors. By examining these factors, the study contributes to our understanding of how financial education can be tailored to enhance financial outcomes for young adults in similar urban settings.

4. Jangid et al. (2023) This study focused on assessing the financial literacy awareness of Kharghar youth in Navi Mumbai through a survey of 206 college students. Using structured questionnaires, the research examined knowledge across domains such as budgeting, savings, investing, debt management, and expenditure control. The findings aim to provide useful insights for designing effective financial education programs and policies tailored to young individuals. The study emphasizes that understanding personal finance is crucial for achieving long-term economic security.

5. Chock and Chin (2023) In this research,explored financial literacy among USM undergraduates from diverse gender and ethnic backgrounds using embeddedness theory. Conducted as a cross-sectional study with purposive sampling and qualitative interviews, it revealed that family structures and social networks are primary determinants of students' financial literacy. The findings suggest that educators should develop realistic programs targeting youth to prevent issues like bankruptcy while fostering long-term financial competence.

6. Jangid et al. (2023) This study focused on assessing the financial literacy awareness of Kharghar youth in Navi Mumbai through a survey of 206 college students. Using structured questionnaires, the research examined knowledge across domains such as budgeting, savings, investing, debt management, and expenditure control. The findings aim to provide useful insights for designing effective financial education programs and policies tailored to young individuals. The study emphasizes that understanding personal finance is crucial for achieving long-term economic security.

7. En Mao et al.(2023) This research surveyed 617 college students to assess their preparedness for managing finances. Despite recognizing the importance of financial literacy, students displayed low interest in learning about it. Family influence emerged as the most significant factor shaping their attitudes toward money management. The study advocates for mandatory personal finance courses in colleges to bridge gaps between awareness and practical application.

8. Pranusha (2023) This study highlighted the importance of educating Indian college students about managing money responsibly through budgeting, saving, investing, and spending wisely after meeting expenses. Based on data from 50 respondents at Gopalan College of Commerce analyzed through statistical tools, the research emphasizes fostering awareness about personal finance to prepare students for future challenges.

9. Thapa and Nepal (2023) This study surveyed 436 college students in Nepal to explore their financial literacy and the factors influencing it. The findings revealed that while students possess basic financial knowledge, they struggle with complex financial topics such as credit, taxes, stock markets, financial statements, and insurance. Parental influence significantly shapes students' financial attitudes, and demographic factors like income, age, field of study, and college type play a crucial role in determining financial literacy levels. The study concludes that students overall literacy is shaped by demographic, educational, and personality characteristics.

10. Mia B Russell et al. (2021) The research explored how COVID-19 impacted student financial well-being and college persistence based on human needs theory. It found that satisfaction of needs and social belonging significantly influenced retention rates during the pandemic. Recommendations were provided for universities to support students during crises by addressing their emotional and economic challenges.

11. Suyanto et.al(2021) This research analyzed the spending patterns of 595 Indonesian college students using Structural Equation Modeling (SEM). It found that financial socialization positively impacts financial literacy and behavior, while financial experience negatively affects literacy but positively influences behavior. However, inadequate financial skills among students increase the risk of poor decision-making. The study highlights the importance of fostering socialization experiences to develop financial literacy and improve behavior.

12. Yahaya et al.(2019) This study assessed the relationship between financial knowledge, attitudes, and behavior among 370 Malaysian university students using regression analysis. It found that while higher financial knowledge correlates with positive attitudes toward money management, it does not directly influence behavior. Students who took Financial Management courses exhibited higher literacy levels than those who did not. The research underscores the need for universities to implement measures that enhance students' financial discipline.

13. Thomas and Subhashree (2019) In this research,. This paper focuses identifying and assessing the various determinant factors of financial literacy among the engineering students. By data collected from 253 students, the study has found that financial knowledge, financial attitude, family influence, and peer-group pressure influenced the level of financial literacy among the engineering undergraduate students. The findings suggest that long term deliberate attempts are essential for improving the financial literacy among the engineering students.

14 **.Herawati et.al (2018)** This study was aimed at analyzing factors that influence financial behavior among accounting students in Bali. This study used the quantitative approach through distributing questionnaires and a financial literacy test. The sample was selected through the multistage random sampling technique with the sample size of 518 respondents. The data were analyzed by using multiple regression analysis. The results of the study showed that there is a positive and significant effect of financial literacy, financial self efficacy, social economic status on financial behavior. Social economic status has the highest contribution.

15 **.Grohmann (2018) -** Grohmann's 2018 study analyzes the financial literacy and behavior of middle-class individuals in an urban Asian economy. The research, focusing on people living in Bangkok, uses standard financial literacy questions to assess levels comparable to those in industrialized countries. However, the study finds that understanding more advanced financial concepts is lower. Savings accounts are commonly held, but more sophisticated financial products are less prevalent. The research aligns with existing literature, indicating a positive relationship between higher financial literacy and certain financial behaviors

Research Methodology

Objectives of the Study

1. To understand and identify various financial literacy factors among college student 2. The main objective to analyse the financial level awareness among college student in Delhi /NCR.

Table: 1 Research Methodology Summary:

Research study	Descriptive study
Geographical coverage	Delhi/NCR
Time Frame	4Months
Approach	Questionnaire survey
Analytical Tool	Qualitative and Quantitative
Sampling Techniques	Nvivo12, Excel, SPSS
Scale adopted from	Binoy Thomasa, P. Subhashree(2018)

Research design:

The research design is a blueprint that outlines how the study will be conducted, including the methods of data collection, the sample population, and how the data will be analyzed. For assessing financial literacy awareness, a quantitative, descriptive research design would be appropriate. This type of design allows you to measure and quantify the level of awareness among a large group of participants.

Quantitative Approach:

By using surveys or questionnaires, you can gather numerical data that is easy to analyze.

Financial literacy, which can be measured using specific questions about financial concept (e.g., budgeting, investing, interest rates), lends itself well to quantitative methods.

1. Research Type

This study is a descriptive study, which aims to systematically analyze and describe the financial literacy awareness among college students in Delhi/NCR. The descriptive research approach is chosen because it allows for a comprehensive assessment of financial literacy levels without influencing the variables under study. It helps in understanding the existing knowledge, attitudes, and behaviors related to financial management among students.

2. Geographical Coverage

The research will be conducted in Delhi/NCR, covering major colleges and universities within the region. Delhi/NCR is selected due to its diverse student population, representing a mix of public and private institutions, various academic disciplines, and different socio- economic backgrounds. The study will aim to include students from institutions such as Delhi University (DU), Jawaharlal Nehru University (JNU), Indraprastha University (IPU), Amity University, and others to ensure a broad representation.

3. Time Frame

The study will be conducted over a period of four months, with the following breakdown: Month 1: Literature review, research framework development, and questionnaire design.

Month 2-3: Data collection through questionnaire distribution and survey responses. Month 4: Data analysis, interpretation, report writing, and conclusion formulation. This timeline ensures a structured approach while maintaining flexibility for unforeseen delays in data collection and analysis.

4. Data Collection Tool

The primary data collection tool for this research will be a questionnaire survey. The structured questionnaire will be designed to assess financial literacy levels, including knowledge, awareness, and financial behavior among students. It will include:

Demographic Details: Age, gender, academic background, and income level of the family. Basic Financial Knowledge: Awareness of inflation, interest rates, savings, budgeting, and debt management.

Awareness of Financial Products: Understanding of loans, insurance, mutual funds, , and digital banking.The questionnaire will include close-ended questions (MCQs and Likert scale questions) for quantitative data .

5. Research Approach

The study follows a mixed-method approach, incorporating both quantitative and qualitative methods:

Quantitative Approach: The majority of the data will be collected through structured survey responses, allowing for statistical analysis of financial literacy levels. This helps to ensures a more comprehensive understanding of financial literacy levels and associated behaviors .

6. Analytical Tools

The data collected will be analyzed using multiple analytical tools to derive meaningful conclusions:

Nvivo 12: Used for qualitative data analysis, including thematic analysis of open-ended responses.

Excel: Used for basic data organization, descriptive statistics, and graphical representation. SPSS (Statistical Package for the Social Sciences): Used for advanced statistical analysis, including:

7. Sampling Technique

The study will use a convenience sampling technique, where participants will be selected based on accessibility and willingness to participate. This method is practical for targeting college students within a limited time frame. While it may introduce some bias, efforts will be made to include a diverse sample from different colleges, academic disciplines, and socio-economic backgrounds to enhance representativeness.

8. Scale Adopted

The research will adopt a validated financial literacy scale from Ivanov, S. et al, ensuring reliability in measuring financial knowledge, attitudes, and behaviors. This scale has been used in previous studies to assess financial literacy across different populations, providing a standardized method for evaluation.

9. Expected Outcome

The study aims to:

Evaluate the financial literacy levels among college students in Delhi/NCR.

Identify gaps in financial knowledge and behavioral patterns among different demographic groups.

Proposed Model

Financial literacy awareness is influenced by multiple factors, including education, socioeconomic background, and financial experience. The study aims to evaluate financial knowledge, attitudes, and behaviors among college students in Delhi/NCR.

1. Financial Knowledge

- Understanding of basic financial concepts (inflation, interest rates, risk & return, taxation)
- Awareness of financial products (bank accounts, credit cards, loans, insurance, mutual funds)

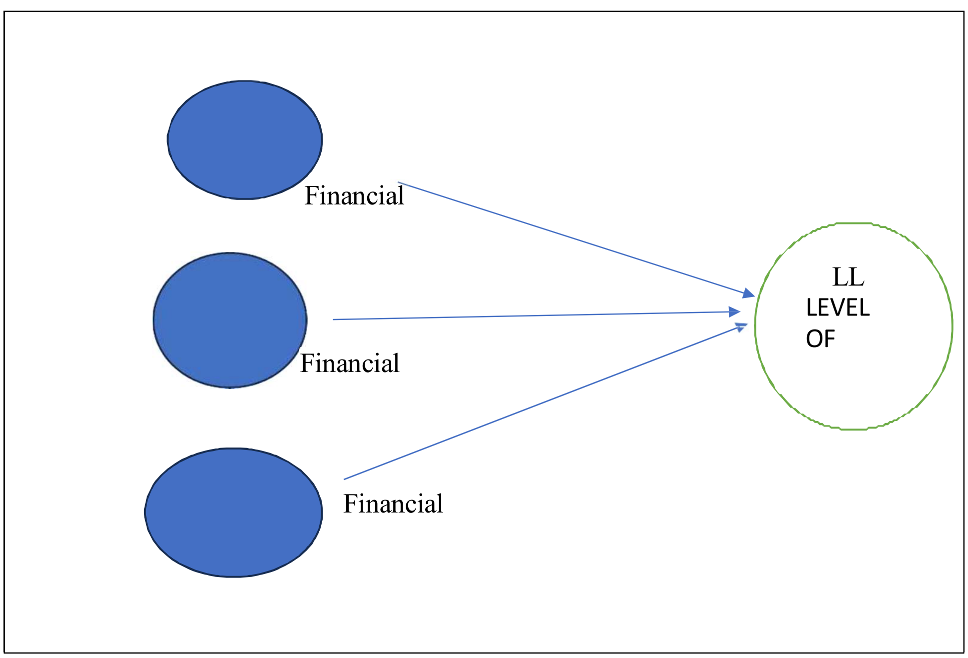
2. Financial Attitude

- Attitude towards saving, budgeting, and investment
- Risk tolerance in financial decision-making

3. Financial Behavior

- Budgeting and expense tracking
- Investment and savings habits

Fig: proposed model



Conclusion

This research methodology ensures a structured and systematic approach to assessing financial literacy awareness among college students in Delhi/NCR. By using and qualitative methods quantitative methods, using validated scales, and applying statistical analysis tools, the study will provide valuable insights into students' financial knowledge, attitudes, and behaviors. The findings will contribute to the development of effective financial literacy programs, ultimately empowering students to make informed financial decisions.

Qualitative Analysis

An extensive analysis of the literature review on financial literacy awareness level among college student has been covered. Research paper has been retrieved from various online source such as Google Scholar. Various related key words such as financial behavior, spending habits, budgeting, financial awareness etc. and combinations of these words were used to locate the relevant studies for analysis, keeping the study's objective and scope in mind research paper in the field of safety have been included .NVIVO 12 by QSR International, a qualitative analysis (QDA) programme, has been utilized for preliminary literature analysis. It is possible to import, sort, and analyse text document, papers, PDFs, data using the software package NVivo , which the aids in the management and analysis of qualitative data. Thematic autocoding and word frequency search queries were used in the qualitative analysis to aid in a broad comprehension of the literature. The findings from NVivo 12 are displayed in the following section.

Fig 1: Word cloud :explore the words most frequently used (Research own's output)

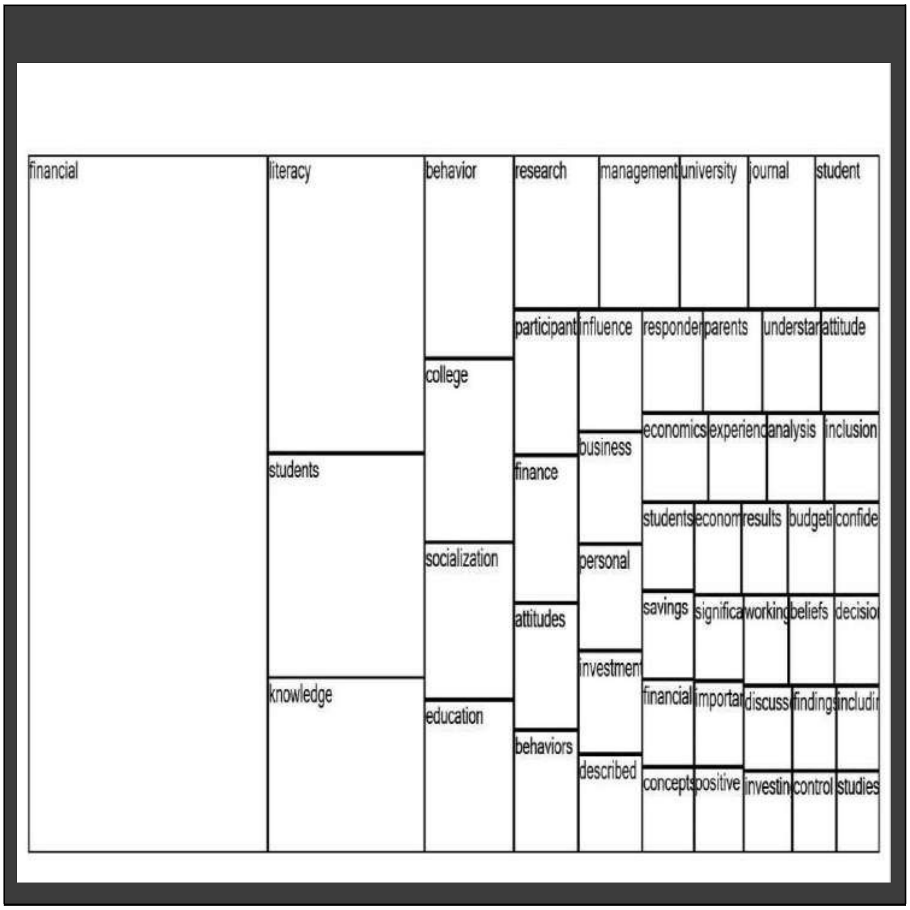


Fig 2: Tree Map (Source: Research own's Output)

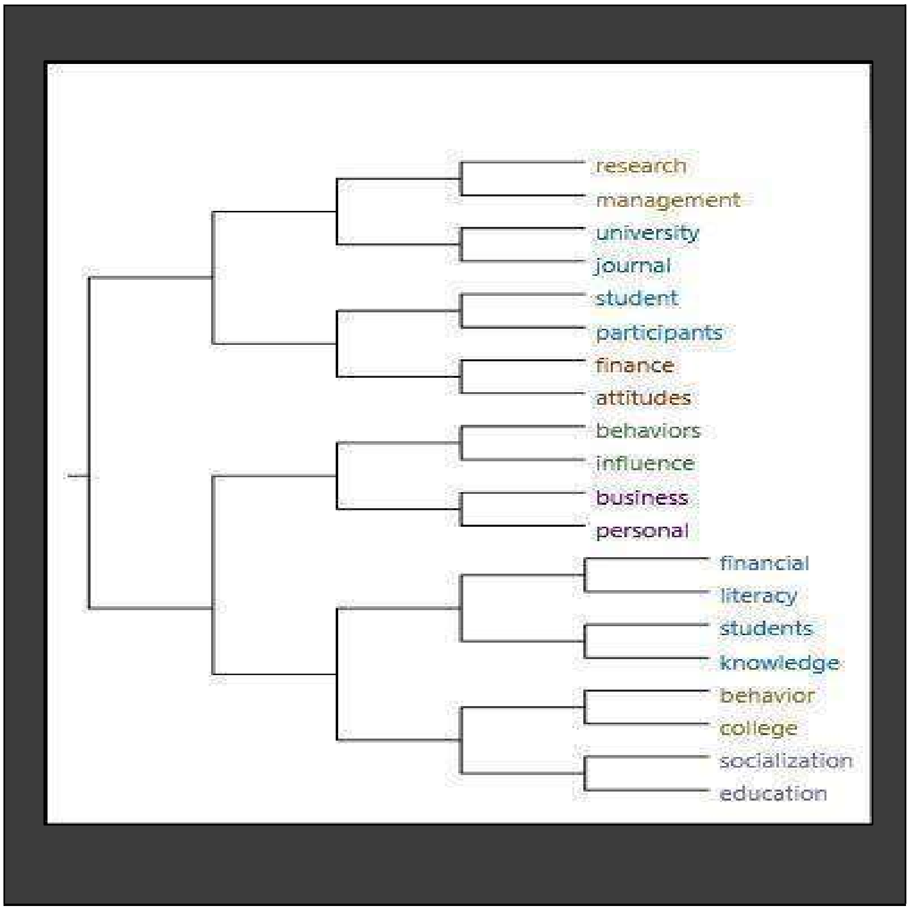


Fig 3: Cluster analysis in NVivo:

Word frequency	Length	Count	Weighted Percentage (%)
Financial	9	8486	5.78
Literacy	8	2358	1.61
Students	8	1776	1.21
Knowledge	9	1386	0.94
Behavior	8	928	0.63
College	7	840	0.57

Socialization	13	722	0.49
Education	9	694	0.47
Research	8	670	0.46
Management	10	640	0.44
University	10	534	0.36
Journal	7	530	0.36
Student	7	510	0.35
Participants	12	476	0.32
Finance	7	474	0.32

Attitudes	9	41 8	0.2 8
Behaviors	9	39 8	0.2 7
Influence	9	39 0	0.2 7
Business	8	36 2	0.2 5
Personal	8	34 8	0.2 4
Investment	10	32 8	0.2 2
Described	9	31 6	0.2 2
Respondents	11		
Parents	7		
Understandi ng	13		
Attitude	8		
Economics	9		
Analysi	8	25	0.1
Experience	10	266	0.18
Inclusion	9	250	0.17

Fig 4:Word Frequency(research own's output)

Quantitaive Analysis

The scales were created based on earlier research that was covered in the literature review and that shown acceptable internal reliability and convergent validity. Factor analysis and a simple linear regression analysis are used to evaluate the suggested study version in IBM SPSS Statistics 21. The first suggesting (strongly Disagree) and fifth suggesting on a five- point Likert scale were employed (strongly Agree). The questionnaire's construct reliability (Cronbach's alpha) is higher than the advised level of 0.7.

Reliability Statistics

Reliability Score through Cronbach's alpha was found to be .916, which is quite higher than the standard value of 0.7 as shown in below table. Besides this, Reliability analysis of each construct was done to test whether a group of items consistently reflected the construct it is measuring

Table1: Reliability statistics (Source: Research Output)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.916	.918	19

Kaiser-Meyer-Olkin (KMO)

The KMO Test evaluates the data's suitability for factor analysis. KMO's value of 0.878 demonstrates the validity of the data that was gathered. Because the significance level is below 0.05, the linear relationship does not contain an authenticity when the Bartlett's Test of Sphericity is used to check for any null hypothesis. The performed structural model will benefit the data, the findings indicate.

Table 2: KMO and Bartlett's Test (Source: Research Output)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		878
Bartlett's Test of Sphericity	Approx. Chi-	900.43
	Df	171
	Sig.	<.001

Table 3: Factor Analysis Summary (Source: Research's own Output)

Serial No.	Factors	Descriptions	Factor loading
1	Financial Knowledge	I understand the basic concepts of personal finance (savings , budgeting, investing)	.645
2		I can differentiate between simple and compound interest.	.728
3		I am aware of inflation and its impact on purchasing power.	.735
4		I understand the concept of risk and return in investments.	.793
5		I can interpret financial statements such as balance sheets and income statements	.597
1	Financial Attitude	I believe financial planning is essential for long-term security.	.645
2		I feel confident in making financial decisions independently.	.448
3		I think investing in stocks or mutual funds is better than keeping money in a savings account.	.601
4			
5		I am willing to take financial risks for higher	.772

		returns. I prefer financial security over short-term financial gains.	.653

1	Financial Awareness and Sources information	I am aware of government financial schemes (e.g., tax benefits, pension plans).	.494
2		I regularly seek financial advice from experts or credible sources.	.577
3		I rely on social media and the internet for financial information.	.591
4		I understand the impact of credit scores on financial opportunities.	.710
5		I actively participate in financial literacy programs or workshops.	.618
1	Financial Behavior	I keep track of my monthly income and expenses.	.714
2		I set aside a portion of my income for savings and investments.	.746
3		I make financial decisions based on careful planning rather than impulse.	.648
4		I compare financial products (e.g., loans, insurance) before making a decision.	.557

Findings of the Study

1. General Financial Literacy Levels

- The study reveals that a majority of college students have inadequate financial literacy, particularly in areas such as budgeting, savings, investments, taxation, and debt management.
- While students may be familiar with basic financial concepts, they often lack a deeper understanding of financial planning and long-term wealth management.

2. **Sources of Financial Knowledge**

- A significant portion of students rely on informal sources such as family members, friends, and social media rather than structured financial education.

- Very few students have received formal training in financial management from their academic institutions, highlighting a gap in the education system.

3. **Financial Behavior and Practices**

- A considerable number of students do not maintain a structured budget for their expenses. Many spend their allowances without keeping track of where their money goes.

- **Savings habits are inconsistent**—while some students set aside money, many lack disciplined saving behavior or an understanding of investment options.

- **Investment knowledge is particularly low**—most students are either unaware of or hesitant about financial instruments like mutual funds, stocks, and insurance.

4. **Impact of Digital Financial Tools**

- The use of digital payment methods (UPI, mobile wallets, net banking) is widespread among students, yet their understanding of financial security and fraud prevention is weak.

- Many students overlook cybersecurity risks, such as phishing scams, fake investment schemes, and online frauds.

5. **Demographic Factors Influencing Financial Literacy**

- **Gender-based Differences**: Male students tend to be more confident in financial matters than female students, though this may not always translate into better financial decisions.

- **Academic Background**: Commerce and business students generally have better financial awareness compared to students from arts, science, or other non-finance fields. o **Parental Income and Influence**: Students from higher-income families often have better exposure to financial concepts, as their parents discuss money matters more frequently.

Conclusions of the Study

1. **There is a significant gap in financial literacy among college students.**

- Many students are ill-equipped to manage their finances efficiently, leading to poor spending habits and financial instability in adulthood.

- This gap may result in students falling into debt traps, failing to save, or making uninformed financial choices in the future.

2. **Formal education does not sufficiently cover financial literacy.**

   - Financial management is not a mandatory subject in most school and college curriculums.

   - The absence of structured financial education results in reliance on informal and often unreliable sources for financial guidance.

3. **Students' financial decision-making is influenced by their academic background, gender, and family income.**

   - Commerce and business students exhibit higher financial awareness, while students from other fields often struggle with financial concepts.

4. **A lack of investment awareness restricts students' financial growth.**

   - Despite access to financial markets through digital platforms, students hesitate to invest due to a lack of knowledge and fear of financial losses.

   - Most students fail to recognize the importance of long-term investment strategies, which could secure their financial future.

5. **Digital finance is widely used, but students are vulnerable to financial fraud.**

   - Students regularly use digital payment methods but are often unaware of cybersecurity risks, making them easy targets for scams and frauds.

Scope of the Study

6.1 Implications Of The Study

1. Educational Reforms

- Financial literacy should be integrated into school and college curriculums to equip students with essential financial knowledge.

- Workshops and certification programs in financial management should be introduced at the university level.

- Partnerships between educational institutions and financial experts can help bridge the knowledge gap through guest lectures and seminars.

2. Government and Policy Interventions

- The government should introduce structured financial literacy programs targeting young adults to ensure financial security at an early age.

- Financial regulatory bodies should collaborate with educational institutions to develop easy-to-understand financial learning modules.

- National campaigns on financial literacy should be promoted through social media, digital platforms, and educational institutions.

3. Awareness Campaigns and Practical Learning

- Colleges should organize financial literacy drives, quizzes, and interactive sessions to engage students in learning about money management.
- Financial institutions (banks, fintech companies) should conduct free workshops to educate students on budgeting, saving, and investing.
- Mobile apps and online tools should be developed to teach financial literacy in a gamified manner, making learning more interactive and engaging.

4. Gender Inclusivity in Financial Education

- Special focus should be placed on encouraging female students to participate in financial learning programs, as they often exhibit lower confidence in financial matters.
- Schools and colleges should offer gender-neutral financial literacy training to eliminate stereotypes related to money management.

5. Strengthening Digital Financial Awareness

- Since students widely use digital payments, cybersecurity awareness programs should be introduced to educate them about financial frauds and secure online transactions.
- Educational institutions should provide guidelines on secure financial transactions, covering topics like UPI safety, investment frauds, and phishing scams.

6. Encouraging Investment and Long-Term Financial Planning

- Students should be introduced to basic investment principles through stock market simulation games, workshops, and case studies.
- Encouraging early-stage investment (such as mutual funds, SIPs, and savings accounts) can help students develop a habit of financial planning.

6.2 Limitations of the Study

1. Limited Geographic Coverage

- The study focuses only on college students in Delhi/NCR, which may not represent financial literacy levels across India.
- Different regions may have varying levels of financial awareness due to differences in education systems, economic backgrounds, and financial exposure.

2. Sample Size Constraints

- The sample size, while informative, may not be large enough to generalize findings to the entire student population.

- A larger and more diverse sample could provide deeper insights into financial literacy levels among students.

3. Self-Reported Data Bias

- The study relies on self-reported responses from students, which may introduce biases such as social desirability bias (where students overestimate their financial knowledge to appear competent).

- Some students may have provided incomplete or inaccurate responses due to lack of understanding or personal perception of financial concepts.

4. Lack of Longitudinal Data

- The study captures a snapshot of financial literacy at a single point in time, rather than tracking how financial knowledge and behavior evolve over time.

- A long-term study could provide insights into how financial education and awareness initiatives impact student behavior over the years.

5. Focus on Basic Financial Literacy

- The study primarily assesses general financial literacy (budgeting, savings, and basic investments) but does not explore advanced financial concepts such as taxation, retirement planning, credit scores, and risk management.

- A more comprehensive approach could include financial literacy levels related to entrepreneurship, financial markets, and economic policies.

6.3 Scope of the Study

Despite its limitations, the study has a broad and meaningful scope in understanding financial literacy among students and providing recommendations for improvement.

1. Assessing Financial Awareness Among College Students

- The study focuses on evaluating students' knowledge of essential financial concepts, such as budgeting, savings, investments, and debt management.

- It highlights gaps in financial education and identifies areas where students struggle the most.

2. Understanding Financial Behavior and Decision-Making

- The study analyzes how students manage their personal finances, whether they budget their expenses, save money, or invest.

- It explores financial habits and practices, providing insights into students' financial decision-making.

3. Evaluating the Role of Education in Financial Literacy

- The research examines whether formal education plays a significant role in shaping students' financial knowledge.
- It identifies the need for integrating financial education into college curriculums to improve students’ financial preparedness.

4. Identifying Demographic Influences on Financial Literacy

- The study investigates how gender, academic background, and family income affect financial literacy levels.
- It helps policymakers and educators design targeted financial literacy programs based on these demographic factors.

5. Policy and Educational Implications

- The findings can help universities, financial institutions, and government bodies in designing effective financial literacy programs.
- The study suggests practical steps, such as financial education reforms, awareness campaigns, and investment training, to enhance students' financial skills.

6. Foundation for Future Research

- The study provides a baseline for future research in financial literacy among young adults.
- Future studies can build on this research by exploring long-term financial literacy trends, regional variations, and the impact of financial education initiatives.

References

- SUYANTO, S., SETIAWAN, D., RAHMAWATI, R., & WINARNA, J. (2021). The impact of financial socialization and financial literacy on financial behaviors: an empirical study in Indonesia. *The Journal of Asian Finance, Economics and Business*, *8*(7), 169-180.
- Thomas, G. N., Nur, S. M. R., & Indriaty, L. (2024). The Impact of Financial Literacy, Social Capital, and Financial Technology on Financial Inclusion of Indonesian Students. *arXiv preprint arXiv:2405.06570*.
- Intoccia, T. K. (2023). *The Financial Literacy of College Students: A Case Study of Financial Attitudes, Beliefs, and Confidence*. Drexel University.
- Jangid, M. A., Deshmukh, M. V., & Pareek, M. N. STUDY ON AWARENESS OF FINANCIAL LITERACY AMONG COLLEGE STUDENTS WITH REFERENCE TO KHARGHAR, NAVI MUMBAI.

- Chock, W. Q. L., & Chin, Y. W. (2024). Financial Literacy among Undergraduates: A Study in Universiti Sains Malaysia. *e-BANGI Journal*, *21*(1).

- Yahaya, R., Zainol, Z., Osman, J. H., Abidin, Z., & Ismail, R. (2019). The effect of financial knowledge and financial attitudes on financial behavior among university students. *International Journal of Academic Research in Business and Social Sciences*, *9*(8), 22-32.

- Yadav, S. K. S. INTERNATIONAL JOURNAL OF TRADE AND COMMERCE- IIARTC.

- Sengottaiyan, N., Somasekar, J., & Girish, M. Gopalan College of Engineering and Management.

- Cude, B., Lawrence, F., Lyons, A., Metzger, K., LeJeune, E., Marks, L., & Machtmes,

- K. (2006). College students and financial literacy: What they know and what we need to learn. *Proceedings of the Eastern Family Economics and Resource Management*

- *Association*, *102*(9), 106-109.

- Wage, M. F. M., Saludez, K. A., Anunciacion, J. A. R., Imperial Jr, A. M., Castillo, L. O., & Rufino, H. D. (2025). Financial Behavior and Financial Well-Being of Working Students in a State University: Financial Literacy as Moderating Factor. *Review of Integrative Business and Economics Research*, *14*(1), 581-597.

- Supriyadi, A., Saifi, M., & NP, M. G. W. E. (2024). The Effect of Financial Literacy on Loan Repayment Performance of MSMEs: A Literature Review. *KnE Social Sciences*, 228-246.

- Douissa, I. B. (2020). Factors affecting College students' multidimensional financial literacy in the Middle East. *International review of economics education*, *35*, 100173.

- Luksander, A., Beres, D., Huzdik, K., & Nemeth, E. (2014). Analysis of the factors that influence the financial literacy of young people studying in higher education. *Public Finance Quarterly= Pénzügyi Szemle*, *59*(2), 220-241.

- Kamel, A. M., & Sahid, S. (2021). Financial Literacy and Financial Behaviour of University Students in Malaysia. *Turkish online journal of qualitative inquiry*, *12*(9).

- Alexandro, R. (2019). Factors affecting student financial behavior in Indonesia.

CUSTOMER ENGAGEMENT IN ONLINE CLOTHING INDUSTRY

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Abstract

The digital revolution has transformed the Online Clothing Industry, necessitating an analysis of customer engagement factors and their influence on business and societal behaviors. This study, based on data from 50 university students in Delhi, reveals that apparel popularity, shopping frequency, social media, and platforms like Amazon, Flipkart, and Myntra play key roles in consumer interaction. Findings emphasize the importance of product quality, competitive pricing, and customer reviews, alongside leveraging social media for brand engagement. While discounts are impactful, fostering a positive customer experience and employing a comprehensive strategy are crucial to driving loyalty and sales. Limitations include sampling bias and geographic constraints.

Keywords: Customer Engagement, Online Clothing Industry, Social Media, Multi-Platform Strategy, Consumer Behaviour.

Introduction

In an era where digital interfaces are the new storefronts, understanding customer engagement has become paramount for the online clothing industry. The term 'Customer Engagement' encapsulates the multifaceted interactions between consumers and brands, extending beyond mere transactions to encompass the full spectrum of a customer's experience. It is the emotional and psychological attachment that customers form with a brand, often cultivated through various channels of communication, be it through direct response, commerce, product interaction, or the cumulative experience, both online and offline.

The advent of e-commerce has revolutionized the way brands connect with their customers, making engagement a critical metric for success. Engaged customers are known to purchase more, advocate more, and exhibit greater loyalty. In the absence of a brick-and-mortar presence, online retailers must harness the power of customer engagement to foster relationships and build brand loyalty.

This study delves into the essence of customer engagement within the online clothing sector, exploring its types, such as Customer Lifetime Value (CLV), Customer Referral Value (CRV), Customer Influence Value (CIV), and Customer Knowledge Value (CKV). Each type represents a unique facet of engagement, from the revenue potential of a customer over time to the influence they wield through social networks and product knowledge.

The research further investigates the strategies for bolstering online customer engagement. Interactivity, personalization, value creation, and brand loyalty emerge as pivotal elements. The role of social media, visual appeal, exclusive releases, community building, and customer retention programs are examined as instrumental in cultivating a vibrant and loyal customer base.

In light of the digital age's demands, this study aims to provide a comprehensive understanding of the factors impacting customer engagement and the potential for customer advancement in the online clothing industry. It seeks to offer insights into the necessity of engagement strategies for online retailers and the impact of such strategies on business growth and customer satisfaction.

How to build Online Customer Engagement?

Social Media Marketing has emerged as a key driver of customer engagement across industries, including e- learning, food, hospitality, and fashion. As the internet integrates into daily life, social media platforms are increasingly used by businesses and individuals to enhance client satisfaction and engagement. Major brands leverage tools like humor, responsive interactions, personalized discounts, and offers to foster loyalty. This paper also explores other significant factors influencing customer behavior.

Need of the Study

Customer/ Client Engagement refers to an emotional connection between a client and a brand. When you engage your guests, you draw them closer to your brand, business and association. Client Engagement helps to continually demonstrate commitment to the client and helps in value creation. In moment's uncertain business terrain, it's absolutely necessary that businesses keep their guests near to them. This study will estimate client Engagement in the Online Clothing Industry. The exploration paper studies the factors impacting client engagement, consequences of client engagement and the possibility of client advancement.

Review of literature

Ramzan and Syed (2018) examined the impact of content-based social media marketing on customer loyalty and motivation to share content through customer engagement. Using 200 social media users as respondents, the study revealed that content-based marketing significantly enhanced consumer engagement, leading to loyalty and content sharing. It also demonstrated improved e-marketing effectiveness. However, the study was limited to content-based social media marketing, excluding other strategies.

Yoong and Lian (2019) explored how social media client engagement influences purchase intentions in Malaysia's hotel industry. Four key motives—surveillance, social commerce, information sharing, and attraction—were examined among individuals aged 18 and above who stayed in four- and five-star hotels. Statistical analysis revealed that social commerce effectively drives engagement, which positively impacts purchase intentions. The study recommended strategies focusing on reputation building, quality information, attractive content, effective communication, branding, and word-of-mouth referrals.

Jayasingh and Sudarsan (2019) This study examined the determinants of client brand engagement on Facebook brand pages and their impact on brand loyalty. Using data from activities of 100 brands' Facebook pages and a questionnaire, the findings revealed higher engagement rates for mobile, computer, and airline brands compared to electronics, restaurants, and retail brands. Key determinants included information-seeking, profitable benefits, and social influence, which stimulated consumer participation on social media. The results highlighted a strong link between engagement and brand loyalty, with amusing content driving higher engagement rates among followers.

Rather (2019) investigated how consumer engagement influences satisfaction, trust, commitment, and loyalty in the hospitality industry. The study revealed that consumer engagement significantly impacts these constructs, with trust contributing most to loyalty, followed by satisfaction and commitment. Satisfaction, commitment, and trust were found to mediate the relationship between engagement and loyalty. It was suggested that hospitality businesses enhance engagement through strategies such as public activities, sponsorships, charity events, social campaigns, and corporate social responsibility, as these positively shape consumers' perceptions.

Chitsimran and Parasmehak et al (2020) studied why associations should engage guests through social media and how to achieve this effectively. The analysis revealed that platforms like Facebook and Instagram were most popular among the youth for connecting with brands. Findings highlighted millennials' preferences for post types and frequency. It was concluded that 46.7% of youth agreed brands create engagement through social media posts, while 21.5% were neutral, 20.3% strongly agreed, and a small minority dissented.

Research Methodology

Research objectives describe what is expected to be achieved by a project. These are statements explaining what information the researcher seeks to study in the Research Problem. Research objectives serve to guide the activities of research.

The research objectives studied under this paper are as follows:

1. To study the factors impacting Customer Engagement in Online Clothing Industry.
2. To study the consequences of Customer Engagement in Online Clothing Industry.

Research Design

The study has used a descriptive research design. The study aims to obtain information for systematically describing Impact of Customer Engagement in Online Clothing Industry. Accordingly, the descriptive method of research has been used to answer the questions regarding the research problem.

Sources of Data Collection

The relevant data has been collected from both primary and secondary sources. A questionnaire has been designed to fetch first-hand information regarding Impact of Customer Engagement in Online Clothing Industry. Further secondary data sources such as newspaper articles, relevant websites and research papers have been used for collecting pertinent information.

Sampling of the Data

The Study Targets The Students Of Various Colleges Of Guru Gobind Singh Indraprastha University And Delhi University. According Convince Sampling Has Been Used To Collect Data From Selected College. The Final Sample Consists Of 100 Students.

Time Period of the Study

The study covers the time frame of 1 month.

Analytical Tool

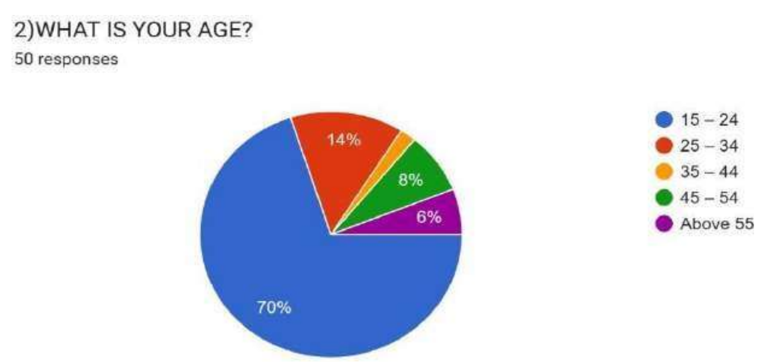
Suitable analytical tools shall be used depending upon the study objectives and nature of the data.

Data Analysis

Understanding Customer Engagement in Online Clothing Industry

1. **AGE**

Age	Percentage
15-24 years	70%
25-34 years	14%
35-44 years	8%
45-54 years	6%
Above 55	2%



The data indicates that the **15-24 age group** is the most engaged in the online clothing industry, comprising **70%** of the customer base. Engagement significantly decreases with age, highlighting a potential market focus for younger consumers.

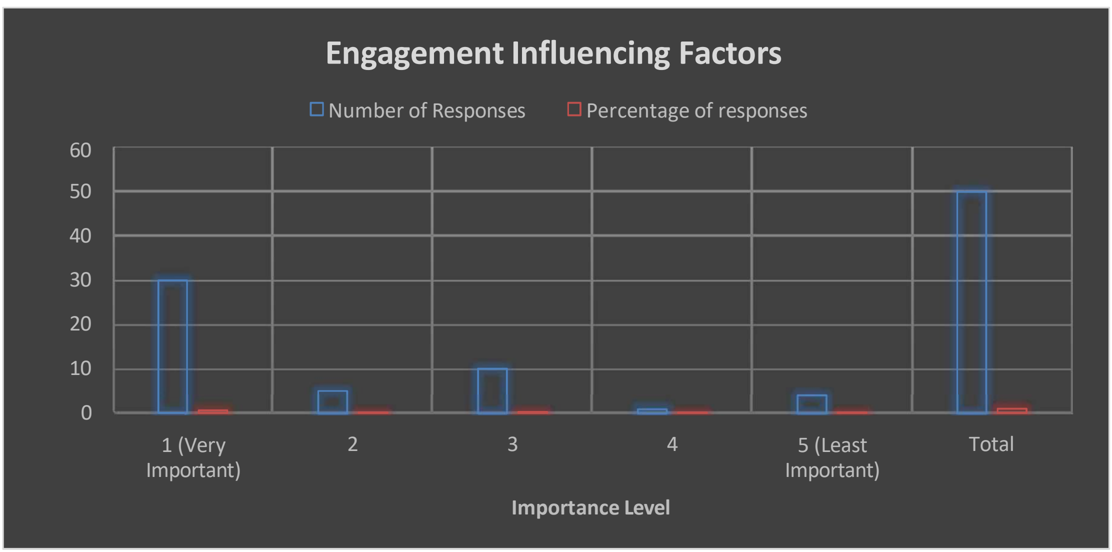
2. Online shopping preferences

Clothing Categories	Responses	Percentage
Apparel (e.g., shirts, dresses, pants)	32	64%
Footwear	24	48%
Accessories (e.g., bags, jewelry)	23	46%
Sportswear	11	22%
Others	10	20%
Average	20	40%

According to the responses it appears that apparel is the most popular category for online shopping among the respondents, with 64% indicating they shop for clothing items like shirts, dresses, and pants. Footwear and accessories also show significant engagement, with 48% and 46% respectively.

3. Engagement Influencing Factors

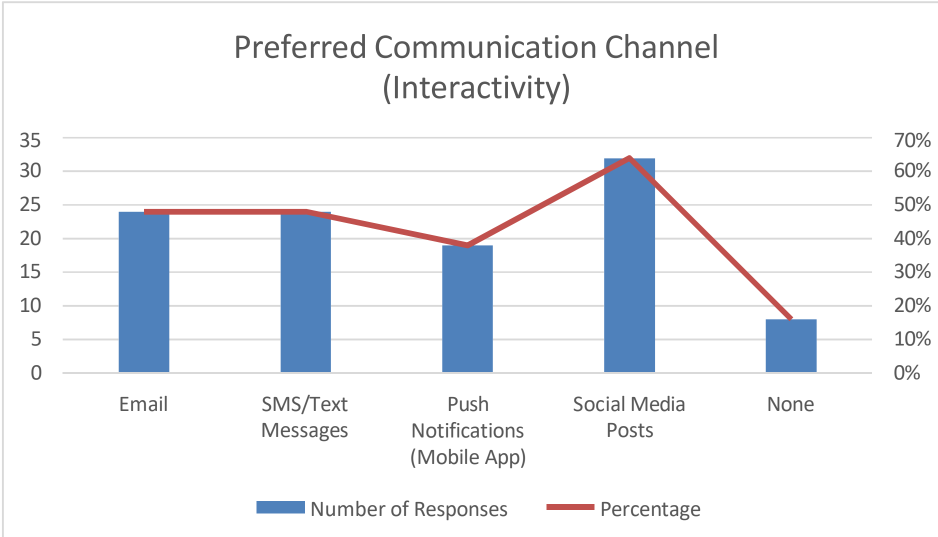
Rating	Number of Responses	Percentage
1	30	60%
2	5	10%
3	10	20%
4	1	2%
5	4	8%
Average	10	20%



The survey results highlight that **product quality, pricing, and customer reviews** are highly influential in engaging customers, with a significant **60%** of respondents rating these factors as the most important. This indicates that for the majority, these elements are crucial when deciding to engage with online clothing brands. The remaining responses are distributed across other levels of importance.

4. **Preferred communication channels (Interactivity)**

ommunication Channel	No: of Responses	Percentage
Email	24	48%
SMS/Text Messages	24	48%



The survey results reveal that **social media posts** are the preferred channel for receiving updates from online clothing brands, with **64%** of respondents favouring this method. Both **Email** and **SMS/text messages** are equally preferred by **48%** of the participants, while **push notifications** via mobile apps are slightly less popular at **38%**. A small percentage, **16%**, prefer not to receive updates at all.

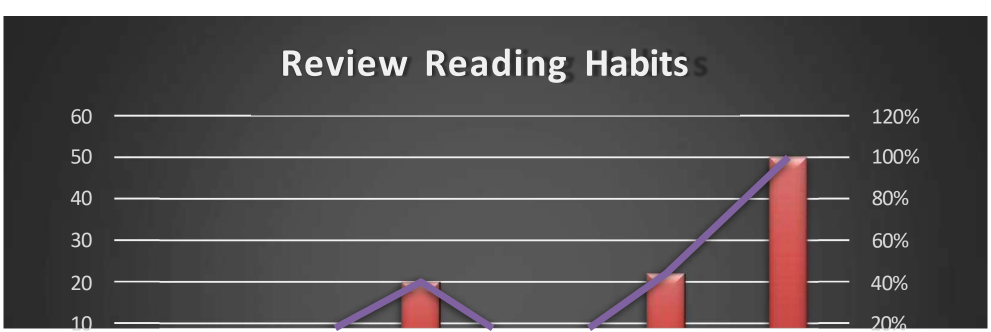
5. Promotional Engagement Impact

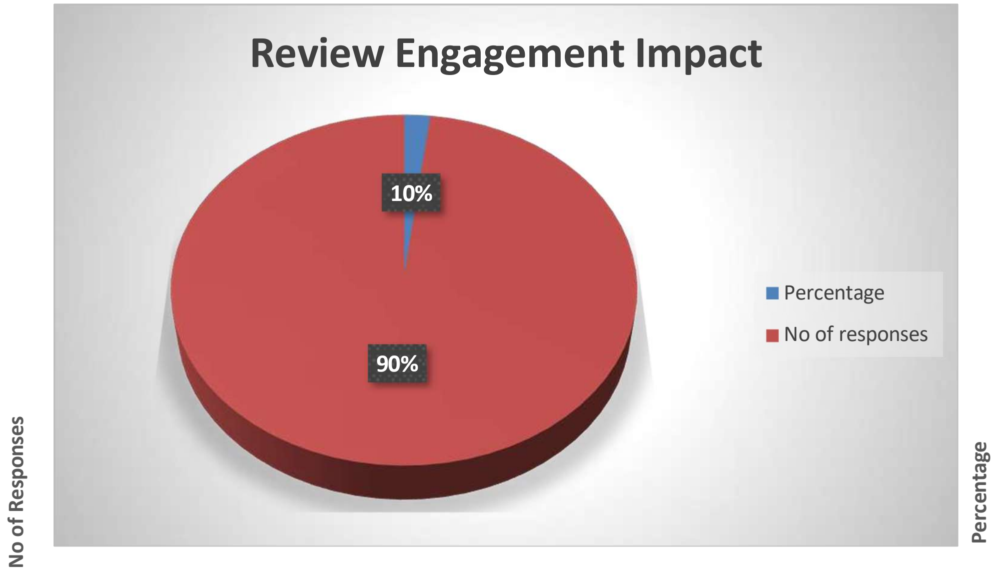
Response	Number of Responses	Percentage
Very likely	21	42%
Somewhat likely	6	12%
Neutral	0	0%
Somewhat unlikely	3	6%
Very unlikely	4	8%

According to the responses, the survey results indicate that discounts and promotions are a strong incentive for engagement with online clothing brands. **42%** of respondents are **very likely** to engage when special offers are presented, while **50%** remain **neutral**, suggesting they might be swayed by other factors or the right kind of promotion. Only a small percentage are **unlikely** to be influenced by discounts.

6. Review Reading Habits

Rating	Number of Responses	Percentage
1	3	6%
2	4	8%
3	20	40%
4	1	2%
5	22	44%
Total	50	100%



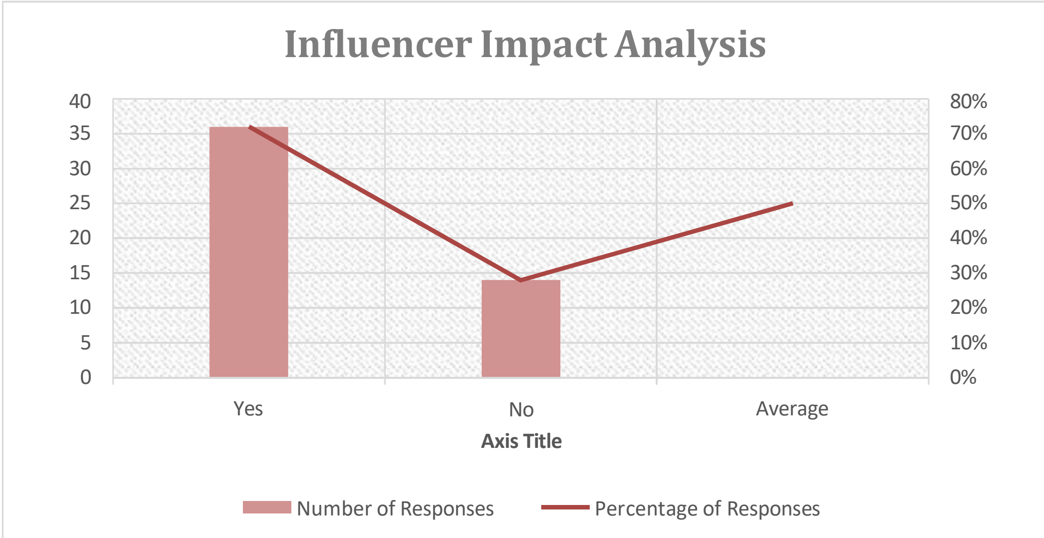


Findings

According to the responses, the pie chart from survey shows a strong consensus among respondents that reviews have an impact on their engagement with online clothing brands, with a significant **90%** affirming this effect. Only **10%** believe that reviews do not influence their engagement.

8. **Influencer Impact Analysis**

Response	Number of Responses	Percentage of Responses
Yes	36	72%
No	14	28%
Average		50%



Findings

Based on the survey data; it seems that a substantial **72%** of respondents have made a purchase influenced by a recommendation from an influencer. This indicates a strong impact of influencer marketing on consumer behaviour in the online clothing industry. It highlights the importance for brands to collaborate with influencers to tap into their audience and drive sales.

9. Brand Advocacy Insights

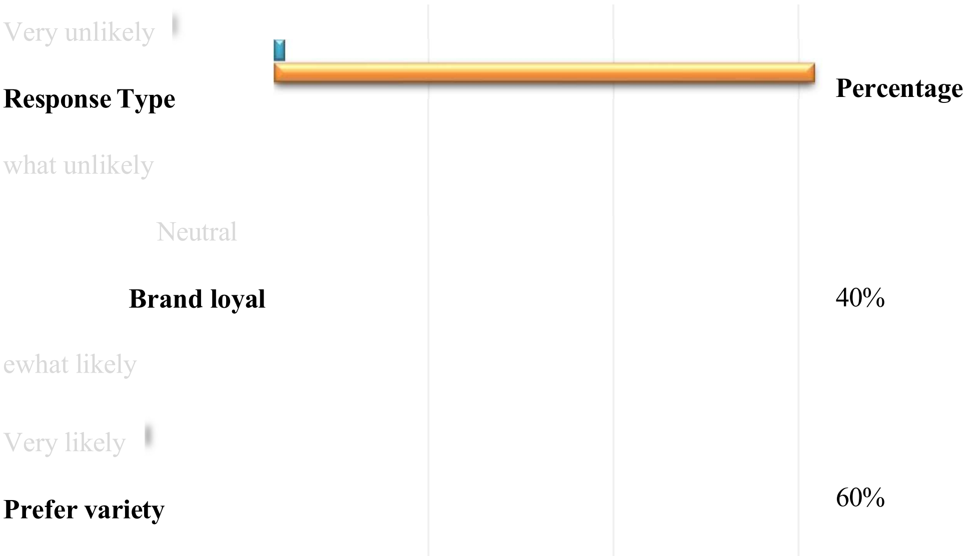
Response	Number of People	Percentage
Yes	37	74%
No	13	26%
Total	50	100%

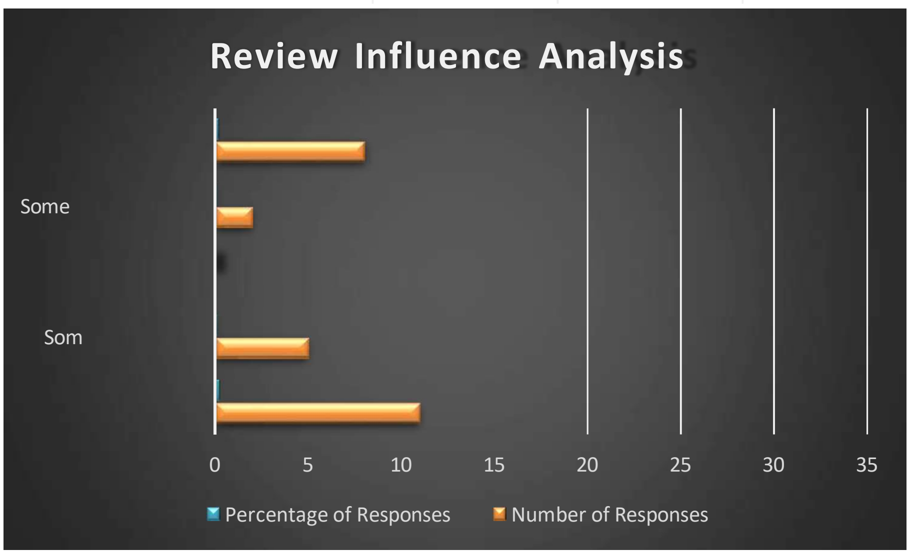
Findings

According to the responses, the pie chart from survey shows that **74%** of respondents have **not recommended** an online clothing brand to someone else, while **26%** have.

10. Review Influence Analysis

Likelihood of leaving a Review or Rating	Number of Responses	Percentage of Responses
Very likely	11	22%
Somewhat likely	5	10%
Neutral	29	58%
Somewhat unlikely	2	4%
Very unlikely	8	16%





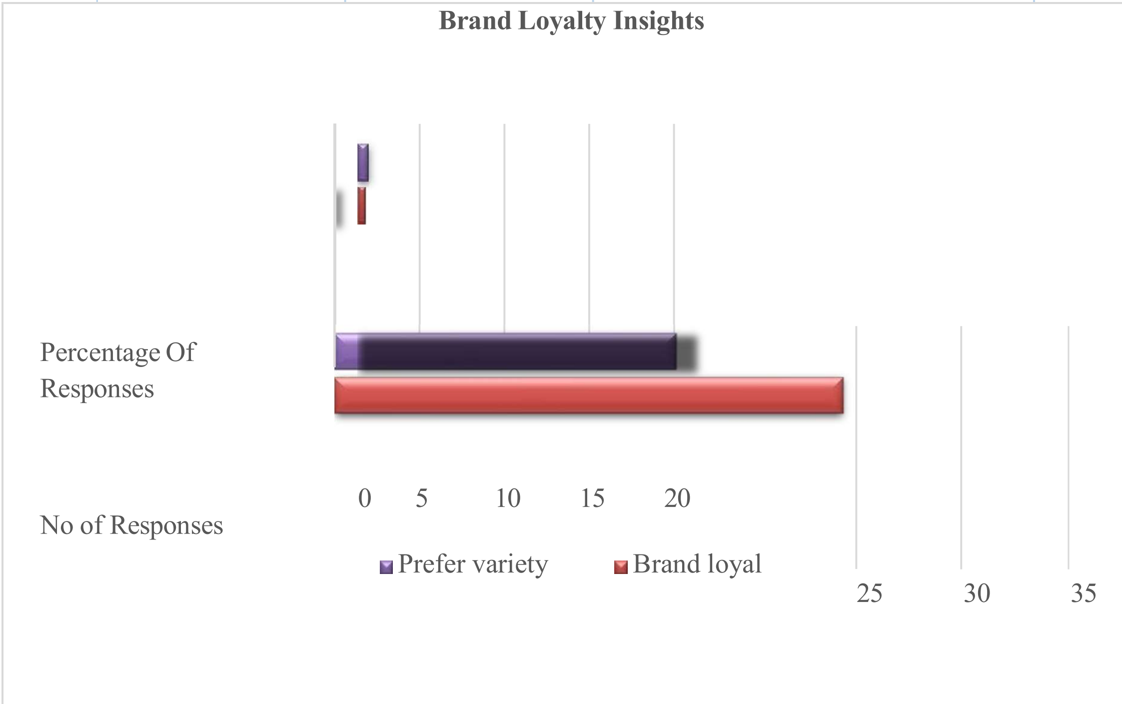
Findings

Based on the data from survey, it appears that customer engagement in terms of leaving reviews or ratings after purchasing from an online clothing brand is predominantly neutral, with a significant **58%** of respondents indicating indifference.

11. Brand Loyalty Insights

Preference	No of Responses	Percentage Of Responses

Brand loyal	30	40%
Prefer variety	20	60%



Findings

Based on the chart analysis from questionnaire, it can be concluded that a majority of customers, **60%**, prefer to explore different brands for variety when shopping for clothing online. This suggests that the online clothing market should focus on offering a diverse range of products to cater to these preferences. Meanwhile, **40%** of customers exhibit brand loyalty, indicating that a significant portion still values consistent quality and familiarity with a single brand.

Discussions

- Apparel is the most popular category for online shopping, while sportswear and niche markets have limited appeal. Survey data shows shopping habits are evenly split, with 52% shopping rarely and occasionally. This highlights potential to convert infrequent shoppers into regular customers.
- The survey results show that Amazon leads as the preferred platform (66%), followed by Flipkart (44%) and Myntra (42%). Meesho, Zara, and others also have notable usage, indicating diverse platform preferences. A multi-platform strategy is essential for wider engagement.
- The survey results reveal that social media is the dominant channel for updates, favored by 64% of respondents, underscoring its significance in customer engagement and brand

communication.

- The survey results highlight that product quality, pricing, and customer reviews are top priorities for 60% of respondents, making them critical to customer trust and satisfaction. Focusing on these elements can boost engagement strategies.

- According to the responses, the chart indicates that interaction with online clothing brands on social media is quite frequent among the respondents. This suggests that social media platforms are an effective way for online clothing brands to maintain regular engagement with their audience.

- According to the responses, the survey results indicate that discounts and promotions are a strong incentive for engagement with online clothing brands. This suggests that while promotions can be effective, they should be part of a broader strategy to engage customers who may be looking for more than just price reductions.

- According to the responses, the graph indicates that Reading customer reviews is common among respondents, with 44% doing so frequently and 40% occasionally, highlighting their significance in purchasing decisions.

- According to the responses, Reviews impact customer engagement significantly, with 90% affirming this effect. Managing feedback and ensuring positive experiences are key to maintaining a strong brand reputation.

- According to the responses, the graph from the survey indicates that Cash on delivery is the preferred payment method for 70% of respondents, despite the prevalence of digital payment options. This indicates its enduring value in the online clothing industry.

- According to the responses, the chart suggests that there is potential for increased customer engagement through word-of-mouth in the online clothing industry. Encouraging satisfied customers to share their positive experiences could be a key strategy for brands looking to expand their reach.

- Based on the data of survey, it appears that Post-purchase reviews are predominantly neutral, with 58% of respondents indifferent to leaving feedback. Addressing this neutrality with motivation or incentives could enhance engagement.

- A majority of respondents (60%) prefer exploring different brands for variety, while 40% exhibit brand loyalty. The online clothing market should balance product diversity with consistent quality to meet these preferences.

- Based on the survey data; it seems that iinfluencer recommendations impact 72% of respondents' purchases, highlighting the importance of collaborating with influencers to drive sales and engagement.

- Based on the partial data visible in the graph, it seems that the Satisfaction levels among respondents show a mixed perception, with 36% rating their engagement as a 3 and 44% as a 5. However, incomplete data on ratings above 5 limits clear conclusions. Analyzing the full range of responses would provide a more comprehensive understanding of customer engagement.

Conclusion

The study of customer engagement in the online clothing industry reveals crucial insights for shaping future strategies. A survey of 50 students highlights diverse shopping behaviors, with equal proportions shopping rarely and occasionally (52%) and a significant portion shopping frequently (32%). These findings suggest an opportunity to convert infrequent shoppers into regular ones.

Amazon dominates as the preferred platform, followed by Flipkart and Myntra, emphasizing the importance of multi-platform strategies. Social media emerges as the key tool for brand updates, preferred by 64% of respondents. Product quality, competitive pricing, and customer reviews, identified by 60% of respondents, are essential for building trust and satisfaction.

Interaction on social media, with 28% daily and 29% weekly engagement, underscores its role in maintaining brand-consumer dialogue. While 42% of respondents are influenced by discounts and promotions, a tailored approach is needed for the neutral demographic. The prevalence of reading customer reviews (84%) highlights the impact of peer opinions on purchasing decisions.

In summary, leveraging social media, prioritizing quality and value, and fostering positive reviews are vital for boosting customer engagement, loyalty, and sales in the competitive digital market.

References

- Ramzan, U., & Syed, A. R. (2018). Role Of Content Based Social Media Marketing In Building Customer Loyalty and Motivating Consumers To Forward Content. Journal of Internet Banking and Commerce, 23(3), 1-20.

- Yoong, C. L., & Lian, S. B. (2019, January 23). Customer Engagement in Social Media and Purchase Intentions in the Hotel Industry. International Journal Of Academic Research in Business and Social Sciences, 9(1), 54-68

- Jayasingh, & Sudarsan. (2019). Consumer brand engagement in social networking sites and its effect on brand loyalty. Cogent Business & Management, 6(1), 1-22

A STUDY ON IMPACT OF STARTUPS ON INDIAN ECONOMY

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Abstract

This study uses a descriptive research design to examine the impact of startups on India's economy from 2017 to 2024, focusing on GDP, GNI, trade balance, imports, and exports. The research relies on secondary data from journals, reports, and official sources like DPIIT and RBI, analyzed using quantitative methods in MS Excel. The study finds that startups positively influence GDP, GNI, and exports, while imports show a negative correlation but still contribute to overall economic growth. Government initiatives like Pradhan Mantri Mudra Yojna, Startup India Seed Fund Scheme, and SAMRIDH Scheme are highlighted as key factors in supporting innovation and entrepreneurship, ultimately strengthening India's startup ecosystem.

Keywords: Startups, Entrepreneurship, Economic Growth, Indian Economy, GDP Impact, Innovation & Technology

Introduction

Start-ups are a key driver of India's economic growth, contributing to innovation, job creation, and trade expansion. They introduce new products and services, transforming industries and enhancing business efficiency. The government's initiatives, such as Startup India and Make in India, provide funding, policy support, and resources to nurture entrepreneurial ventures.

This study examines the relationship between start-ups and economic indicators like GDP, GNI, exports, and imports to understand their role in national development. Findings reveal that start-ups positively impact GDP, GNI, and exports, fostering economic progress, while imports show a negative correlation but still contribute to business expansion. Technological advancements play a crucial role, enabling start-ups to drive innovation and attract investments.

By analyzing trends from 2017 to 2024, this research highlights how start-ups boost economic mobility, create employment opportunities, and improve India's global competitiveness. Government-backed funding schemes, incubation programs, and strategic initiatives continue to support entrepreneurship, strengthening the start-up ecosystem. Understanding these impacts will help policymakers refine strategies, ensuring long-term economic sustainability. As India embraces digital transformation and start-up-driven growth, the entrepreneurial landscape is set to evolve, accelerating the nation’s development and global influence.

Literature Review

Saurabh Chawaria et al. (2024) This article examines the diverse and wide-ranging effects of start-ups on India's economic environment. Start-ups have made a substantial contribution to India's Gross Domestic Product (GDP) in recent years, representing over 1.8% of the overall GDP in 2020. This paper highlights the increasing significance of start-ups as crucial catalysts of economic activity The implementation of programs such as start-up India and region-specific start-up strategies has stimulated the creation of companies in cities classified as tier 2 and tier 3. This has promoted comprehensive development and reduced regional inequalities.

Malpani et al. (2023) The study empirically examines the perception of the promoters regarding these linkages, studies the CSR practices adopted by them, and identifies the challenges faced by them in using CSR for sustainable growth. The findings of the study reveal that there is a distinct relationship between start-up success (sustainability) and CSR activities. The article empirically proves that the sustainability of a start-up is positively dependent upon internal, external, and environmental CSR initiatives. It also concludes that definite structural interventions are required by policymakers to achieve the twin objectives of start-up success and societal well-being.

Sen et al. (2023) The recent shifts in climate patterns have heightened the significance of monitoring agriculture, making it a timely and vigorously pursued research field. This project aims to gather essential on-field data, including air moisture, air, temperature, soil temperature, humidity and soil salinity by utilizing a wireless sensor network system throughout the crop growth period. This data is subsequently transmitted to users via the internet of Things (IoT). It can be updated frequently to a cloud platform, enabling users to monitor field conditions based on sensor readings and motor statuses.

Malhotra et al. (2022)

Entrepreneurs are important contributors to a country's economic development and are at the core of every start-up ecosystem. Start-ups have played an important role in the growth of many economies worldwide by generating employment, increasing innovation and bringing competitive dynamics into the business environment. The findings of the study indicate that external factors have more influence on successful start-ups than internal factor.

Research Methodology

2.1 Research Objectives

1. To analyze the impact of startups on GDP, GNI, balance of payment, import, export.
2. To study about the initiatives taken by government

2.2 Research Design

There are three types of design

- Exploratory research design
- Descriptive research design
- Casual research design

In this study I have taken descriptive research design.

2.3 Data Collection Source

This research is based on secondary data and the matter has been taken from various journals, articles, magazines and reports.

Tool and Instrument for Data Collection

The data used in this research is quantitative (data which comprises numbers) and is computed by using MS excel.

2.4 Population

All India startup registered and Indian economy data

Sampling Size From 2017 to 2024, I used a sample size of 8 years. I used data on the total number of startups registered from the DPIIT report and data on economic indicators from the RBI report.

2.5 Time Period of Study -

The time period of study is 2017-2024

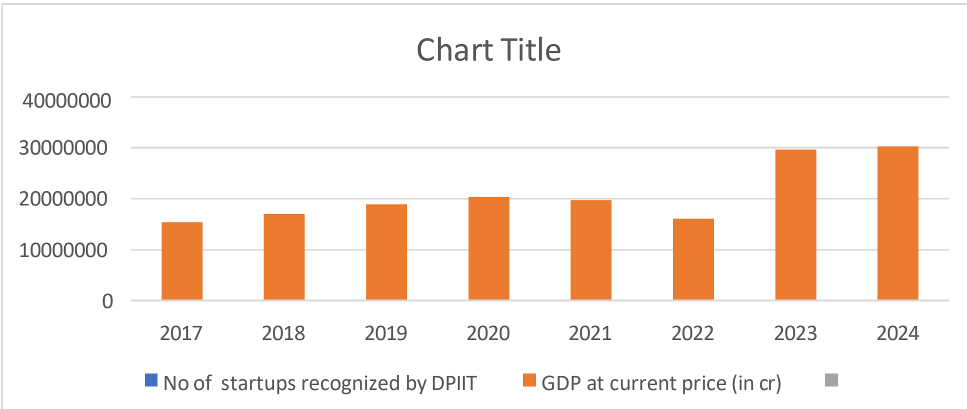
Data Analysis

1. Impact of start up on GDP at current price

Year	**No of startups recognized by DPIIT**	**GDP at current price (in Cr)**
2017	5420	15362386
2018	8946	17095005
2019	11701	18886957
2020	14740	20351013
2021	41061	19745670
2022	84,012	1,60,06,000
2023	117254	29536000
2024	157706	30123000

Result: correlation= 0.81659

Interpretations: I've determined the correlation coefficient between the number of startups registered and the GDP at the current exchange rate. The number of startups that have been registered and GDP at the current exchange rate are strongly positively correlated. This means that startups contribute to the growth of the Indian economy's GDP.



GRAPH 1

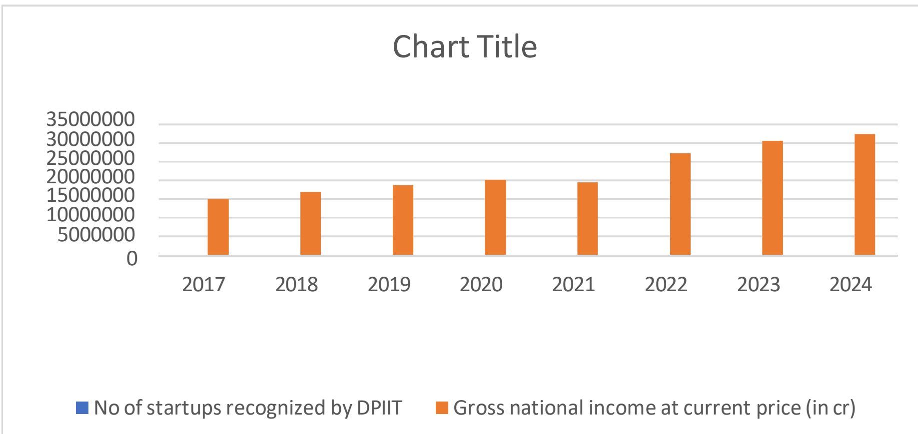
2. Impact of startups on GNI

Year	**No of startups recognized by DPIIT**	**Gross national income at current price (in cr)**
2017	5420	15077384
2018	8946	16905230
2019	11701	18684632
2020	14740	20157899
2021	41061	19561348
2022	84012	324110 00
2023	117254	305940 00

2024	157706	324110 00

Result: 0.970709

Interpretations: The correlation coefficient between the number of startups registered and GNI at the current exchange rate has been determined. The number of startups that have been registered and GNI at the current rate are positively correlated. It suggested that startups have a substantial and measurable impact on the national income.



GRAPH 2

3. Impact of startups on exports

Year	**No. of startups recognized by DPIIT**	**Exports in rs cr**
2016	503	1716384
2017	5420	1849434
2018	8946	1956515
2019	11701	2307663
2020	14740	2193253

2021	41061	1895618
2022	84012	320000 00
2023	117254	29100000
2024	157706	64500000

Result: 0.952781

Interpretations: I have determined the correlation coefficient between the quantity of registered startups and exports. Exports and the number of registered startups have a very strongly positive correlation. It signifies that startups contribute to the Indian economy's increased exports.

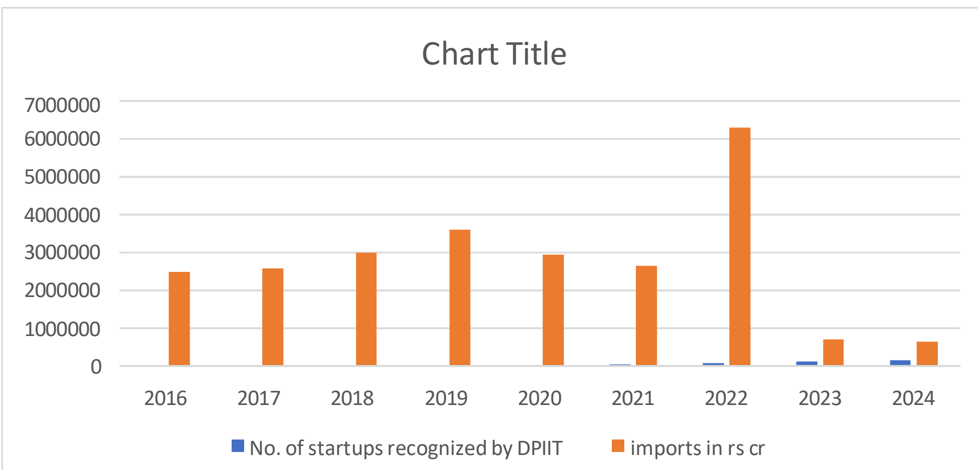
4. **Impact of startups on imports**

Year	**No. of startups recognized by DPIIT**	**imports in Rs Cr**
2016	503	2490306
2017	5420	2577675
2018	8946	3001033
2019	11701	3594373

2020	14740	2946318
2021	41061	2651267
2022	84012	6300000
2023	117254	708936
2024	157706	649440

Result: -0.35593

Interpretations: The correlation coefficient between the number of startups registered and imports has been calculated. The number of startups that have been registered and imports are showing moderately negatively correlated. This means that as the number of recognized startups increases, imports tend to decrease to some extent. This could indicate that startups are contributing to import substitution by promoting local manufacturing and innovation.



GRAPH 4

Initiatives Taken By Government

1. **Samridh Scheme**

On August 25, 2021, a little over a week after announcing that the government would support startups in their early stages, Ashwini Vaishnaw, who was then the newly appointed Minister of Electronics Information and Technology (MeitY), introduced the SAMRIDH scheme, which stands for Startup Accelerators of Meity for product Innovation, Development, and growth.

The SAMRIDH programme aims to support businesses financially while also assisting them in bringing together the skill sets necessary for their long-term success. The second cohort SAMRIDH was launched on (4th September, 2024) by Secretary, MeitY Sh. S. Krishnan. It is a part of the 100-day agenda of the Government of India to select and support 125 startups through potential accelerators so as to achieve the target of nurturing 300 startups. In 2025, the SAMRIDH scheme, implemented by MeitY Startup Hub (MSH), aims to support 300 tech startups through 40 cohorts of 8-10 startups each, with a focus on acceleration services and matching funding of up to ₹40 lakh per startup.

2. **Start Up India Initiative**

On January 16, 2016, the Indian Prime Minister officially unveiled the Startup India Initiative. Giving entrepreneurial spirits wings is to improve wealth and employability. As of June 3, 2021, over 50,000 firms had been recognized via this plan, which provides tax benefits to entrepreneurs over the course of a little more than five years. Additionally, the maximum age for startups has gone up from two to seven years. The number of DPIIT-recognized startups has grown from around 500 in 2016 to 1,59,157 as of January 15, 2025. As of October 31, 2024, a total of 73,151 recognized startups includes at least one-woman director, showcasing the rise of women entrepreneurs in India.As India marks nine years of the Startup India initiative, the focus in 2025 is on "Startup India @ 2047 – Unfolding the Bharat Story," with a second edition of the initiative scheduled for April 3-5 at Bharat Mandapam in New Delhi, aiming to highlight India's future as a global innovation hub.

3. **Start Up India Seed Fund**

To aid startups and encourage the ideas of prospective entrepreneurs, Prime Minister Narendra Modi announced the creation of the "Startup India Seed Fund" on January 16, 2021, with a budget of INR 1,000 crores. According to PM Modi, the government is taking significant steps to ensure that Indian startups do not have funding shortages.

According to the Union Budget for 2022, Rs 283.5 crore is set up for the Startup India Seed Fund project, which is more than the revised estimate of about Rs 100 crore for the years 2021–2022.

As of April 4, 2025, the Startup India Seed Fund Scheme (SISFS) continues to provide financial assistance to eligible startups, with a focus on proof of concept, prototype development, product trials, market entry, and commercialization, according to the Department for Promotion of Industry and Internal Trade (DPIIT).

4. **Pradhan Mantri Mudra Yojna**

To improve lending opportunities and spur the expansion of small companies in rural areas, Micro Units Development Refinance Agency (MUDRA) banks have been established. This programme was put in place by the government to aid India's small companies. The government set aside INR 10,000 crores in 2015 to encourage the startup scene in the nation. Small firms and non-corporate, non-farm small/micro-enterprises are eligible for startup loans from MUDRA banks of up to INR 10 lakhs. The Pradhan Mantri Mudra Yojana (PMMY), which was introduced on April 8, 2015, includes MUDRA. Loans have been divided into Tarun, Kishore, and Shishu categories. There is no collateral security; the assets are created through bank financing.

In 2025, the Pradhan Mantri Mudra Yojana (PMMY) continues to offer micro-loans to non-corporate, non-farm small/micro enterprises, with loan limits up to ₹10 lakhs, and is categorized into Shishu, Kishor, and Tarun for different business needs and stages of growth.

Findings

Impact of Start-ups on GDP

The correlation between the number of start-ups registered and GDP at current prices is 0.81659, indicating a strong positive relationship. This suggests that as the number of recognized start-ups increases, so does India's GDP, reinforcing the role of entrepreneurship in economic expansion.

Impact of Start-ups on GNI

The correlation coefficient between start-ups and GNI is 0.970709, reflecting a very strong positive correlation. This signifies that start-ups substantially contribute to the nation's income growth, strengthening the overall economy.

Impact of Start-ups on Exports

With a correlation of 0.952781, start-ups positively influence exports, demonstrating their role in expanding India's global trade presence. Increased entrepreneurship fosters innovation, making Indian products and services more competitive in international markets.

Impact of Start-ups on Imports

Start-ups and imports show a moderate negative correlation (-0.35593), indicating that as more start-ups emerge, imports decline to some extent. This suggests that start-ups promote local manufacturing and innovation, reducing dependency on foreign goods.

Government Initiatives Supporting Start-ups

SAMRIDH Scheme – Provides financial and skill-based support for technology start-ups, with a target of nurturing 300 start-ups by 2025.

Startup India Initiative – Encourages entrepreneurship by offering tax benefits, incubation support, and policy assistance, increasing DPIIT-recognized start-ups to 1,59,157 by 2025.

Startup India Seed Fund – Allocates INR 1,000 crores for early-stage financing, ensuring start-ups have necessary capital for growth.

Pradhan Mantri Mudra Yojna (PMMY) – Provides loans up to INR 10 lakhs for small and micro enterprises, fostering rural entrepreneurship and financial inclusion.

Conclusion

Startups have the power to transform the world, and in the years to come, there will be an increase in the number of businesses that do so. The only way to accelerate a country's economic progress is through entrepreneurship. And a modest notion might turn into a significant, original answer that alters the course of your life. Therefore, if you have an idea, don't let fear of failure or taking a risk prevent you from following it. Create a startup with your concept and aid in the development of our country. We may now draw the conclusion that startups are crucial for a country's economic development. We can get the conclusion that startups are helping the Indian economy.

The government is promoting entrepreneurship and the measures it is doing, which is beneficial for the startup industry in India and its promising future. And in the future decade, this will undoubtedly strengthen India's economy and GDP.

References

- Tiwari, A., Hogan, T., & O'Gorman, C. (2021). The good, the bad, and the ugly of ‘Startup India'-a review of India’s entrepreneurship policy. Economic & Political Weekly (EPW), 56(50), 45-52.

- Nigam, N., Mbarek, S., & Boughanmi, A. (2021). Impact of intellectual capital on the financing of startups with new business models. Journal of Knowledge Management, 25(1), 227- 250.

- Malhotra, K. (2022). Factors Influencing Startups in an Emerging Economy: A Literature Review. IUP Journal of Entrepreneurship Development, 19(1).

- Maheshwari, A. (2022). Understanding organizational remote engagement and employee social transformation in post-COVID times with special reference to startups in India. European Journal of Human Resource Management Studies, 5(4).

- Chahal, R. S., & Chahal, A. (2023). A study of the impact of the startups India scheme on the Indian economy. International Journal of Financial Management and Economics, 6(1), 69–75. https://doi.org/10.33545/26179210.2023.v6.i1.171

- Malpani, R., & Ghosh, A. (2023). Corporate social responsibility practices: a strategy for Indian startups to sustain. Business Perspectives and Research, 11(2), 246-268.

- Sen, J. (2023). Impact of Startups in Indian Gdp in 2023. In Proceedings of National Conference on Recent Trends of Engineering, Science and (Vol. 116, p. 111). by: Guru Gobind Singh Educational Society’s Technical Campus.

- Chawaria, S. (2024). IMPACT OF STARTUPS ON INDIAN ECONOMY. Journal of

- Philanthropy and Marketing, 4(1), 289-299.

- Maran, K., & Pallathadka, H. (2024). A STUDY OF ECONOMIC FACTORS’INFLUENCE

- ON INDIAN STARTUPS. Journal of Management, 19(1).

- Kumar, D., & Yadav, A. K. (2024). The role of startups in driving technological advancement in the Indian economy. Journal of Social Review and Development, 3(Special 1), 15-19.

- .Chandiok, D. S. (2017). India the world's fastest growing startup ecosystem: A Study. Amity Research Journal of Tourism, Aviation and Hospitality.

- Dharan, S. D. (2017). start-up india-its performance in indian economy .
- Garg, N. (2018). THE ANALYSIS OF IMPACT OF START UPS ON ECONOMY OF
- INDIA. Pramana Research Journal.
- Kumar, D. (2020). START-UP ECOSYSTEM IN INDIA: A STUDY WITH FOCUS.
- Tyagi, M. (2019). OVERVIEW OF STARTUPS POLICIES IN INDIA- WITH SPECIAL.
- GAP iNTERDISCIPLINARITIES.

Websites

- http://www.ijemr.net/DOC/RoleOfStartupsOnIndianEconomy.PDF
- https://www.srcc.edu/sites/default/files/1.Vol_.%202%20Issue%201.pdf
- https://ideas.repec.org/p/wiw/wiwrsa/ersa11p327.html /
- https://www.startupindia.gov.in/
- https://dipp.gov.in/

THE GROWTH OF SUSTAINABLE MARKETING AND CONSUMPTION IN INDIA

INTRODUCTION

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In recent years, sustainable marketing and consumption have emerged as critical components of India's economic and environmental discourse. As the country grapples with challenges such as climate change, resource depletion, and urban pollution, both consumers and businesses are increasingly recognizing the need to adopt more responsible and eco-friendly practices. Sustainable marketing refers to strategies that not only aim to promote products but also emphasize their environmental and social benefits. 1. Understanding Sustainable Marketing and Consumption:

- **Sustainable Marketing** involves promoting products and practices that do not harm the environment and consider long-term ecological balance.
- **Sustainable Consumption** refers to the use of products and services in a way that minimizes environmental impact and considers future generations.
- **2. Drivers of Growth in India**
- **a. Consumer Awareness and Demand**
- Increasing awareness about climate change, pollution, and health is influencing urban Indian consumers.
- Eco-conscious millennials and Gen Zs are more inclined to support sustainable brands.
- There's growing demand for organic, cruelty-free, vegan, and biodegradable products.
- **b. Government Initiatives**
- **Swachh Bharat Abhiyan** (Clean India Mission) has enhanced public consciousness.
- **Single-use plastics ban** and **Extended Producer Responsibility (EPR)** norms encourage businesses to adopt sustainable packaging.
- Support for electric vehicles, renewable energy, and green buildings is part of India's climate commitments under the Paris Agreement.

This shift reflects a broader transformation in consumer behaviour, with a growing segment of the Indian population showing a preference for products and brands that align with ethical, environmental, and social values. As far as green marketing is concerned, it has been recognized as a tool to solve the problem of sustainable developments. Sustainable production and consumption are one of the critical goals of the sustainable development goals (Kar, &

Harichandan, 2022). There are drivers of the growth od sustainability in India. They are as follows:

Consumers Awareness and Demand: Increasing awareness about climate change, pollution risks associate with health have played a crucial role in consumption of sustainable products.

Government Policies and Regulations: Government policies and regulations too played an important role where consumers have become more conscious about the sustainable consumptions.

Challenges to Sustainable Marketing and Consumption

- **Affordability**: Sustainable products often cost more, limiting access for price-sensitive consumers.
- **Greenwashing**: Misleading claims can damage consumer trust and slow the growth of genuine sustainability efforts.
- **Infrastructure Gaps**: Inconsistent recycling, waste management, and supply chain limitations hinder progress.
- **Awareness Gaps**: Rural and semi-urban populations have limited exposure to sustainable consumption narratives.

Literature Review

Green marketing is becoming a very acceptable norm in the society these days. People prefer the products which are considered less polluting and which doesn't harm the health of people. This awareness are the reasons that people are preferring the sustainable marketing and consumption like never before. Joshi and Rahman (2015) conducted a meta-analysis revealing that Indian consumers show a positive attitude for products which are considered green, but actual purchase behavior often lags due to higher prices and lack of availability (Kaur and Bhatia, 2018) found that younger urban consumers are more inclined to prefer sustainable brands, particularly in the personal care and apparel sectors. It has highlighted a significant attitude-behaviour gap, where consumers express environmental concerns but do not consistently act on them Saxena and Khandelwal (2012). A study by Kennedy et al. (2024) in Tamil Nadu revealed that while green product orientation and social influence positively impact green purchase attitudes, green product literacy alone does not significantly influence purchase behavior. Manikandan and Rakshana (2024) highlighted that peer influence and social norms significantly impact sustainable consumption, suggesting that community-driven initiatives could bolster eco-friendly purchasing habits. Sustainable marketing refers to the integration of social, environmental, and economic considerations into marketing strategies. In parallel, sustainable consumption emphasizes the responsible use of goods and services to minimize environmental impact and promote social equity. Recent studies in India (e.g., Singh et al., 2022; Mehta & Sharma, 2023) show a growing preference among Indian consumers for eco-friendly products, ethical brands, and green innovations. However, this preference is often moderated by price sensitivity, limited awareness, and the perceived trade-off between sustainability and convenience. Corporate India has responded to this shift with an increased focus on green product innovation, ethical branding, circular economy models, and sustainability-focused advertising. Startups and large enterprises alike are leveraging sustainability as a source of competitive advantage. At the same time, regulatory frameworks, including Extended Producer Responsibility (EPR), plastic ban, and ESG reporting norm have accelerated the adoption of sustainable practices across sectors.

Conclusion

Over the past few years, there has been a marked increase in consumer awareness, business engagement, and policy support aimed at promoting sustainability. Indian consumers, particularly in urban centers, are increasingly valuing eco-friendly products and ethical brands, although challenges such as price sensitivity, limited product availability, and the persistent attitude-behavior gap remain significant.

On the corporate side, many Indian businesses are embracing sustainable marketing through innovations in product design, packaging, supply chain transparency, and brand communication. Government policies, including plastic bans, Extended Producer

The literature highlights the need for a more integrated and inclusive approach—one that not only addresses consumer behavior but also supports sustainable business models and policy frameworks. There is a clear opportunity for academia, industry, and policymakers to collaborate in scaling sustainable practices through better awareness, affordability, and accessibility of green products.

In conclusion, while India is making significant strides in sustainable marketing and consumption, continued efforts are required to overcome structural, behavioral, and informational barriers. Future research should focus on rural markets, the role of digital platforms, cross-sectoral partnerships, and mechanisms to close the intention-action gap, thus supporting India's broader sustainability goals and contributing to global climate resilience.

References

- Joshi, Y., & Rahman, Z. (2015). Factors affecting green purchase behaviour and future research directions. International Strategic Management Review, 3(1–2), 128–143.
- Kaur, H., & Bhatia, M. P. S. (2018). Exploring young urban consumers' preference for sustainable brands in India. Journal of Retailing and Consumer Services, 45, 132–139.
- Kar, S., & Harichandan, S. (2022). Sustainable consumption and production in India: Progress, policies, and challenges. Journal of Cleaner Production, 341, 130901.
- Kennedy, R., Raj, A., & Elango, M. (2024). Green consumer behavior in Tamil Nadu: The role of social influence and product orientation. Indian Journal of Marketing, 54(2), 15–27.
- Manikandan, V., & Rakshana, P. (2024). Community-driven sustainability: Peer influence and sustainable consumption in urban India. Asian Journal of Sustainability Research, 6(1), 44–58.
- Mehta, R., & Sharma, N. (2023). Changing consumer perceptions towards eco-brands in India: A generational analysis. Journal of Consumer Behaviour and Ethics, 8(3), 67–82.
- Saxena, R., & Khandelwal, P. K. (2012). Greening of industries for sustainable growth: An exploratory study on sustainable practices by Indian companies. International Journal of Social Economics, 39(8), 551–586.
- Singh, A., Kapoor, S., & Bansal, P. (2022). Understanding eco-conscious behavior among Indian consumers: An empirical analysis. South Asian Journal of Business and Management Cases, 11(2), 154–165.

FORMULATION AND EVALUATION OF HERBAL FACE SERUM

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Abstract

Chamomile oil is derived from *Matricaria chamomilla* (commonly known as German chamomile) and *Chamaemelum nobile* (Roman chamomile), both of which are members of the Asteraceae family and originally found in regions of southern and eastern Europe. In India, this medicinal plant is cultivated in several areas, particularly in the northern plains of Uttar Pradesh and Uttarakhand, as well as in Jammu and Kashmir. Due to its well-known anti-inflammatory, antioxidant, and calming properties, chamomile is widely used in natural skincare formulations, especially in face serums. These serums are designed to deliver potent active ingredients, and chamomile extract contributes to reducing inflammation and soothing irritated skin. This literature review evaluates the application of chamomile flowers in cosmetic products, emphasizing their cleansing, beautifying, and skin-nurturing potential. It also presents research-based evidence showcasing the effectiveness of chamomile extracts in promoting healthy and radiant skin.

Introduction-

Serum are thin viscosity topical products that contain concentrated amount of active ingredients. Serum is a concentrated product which widely used in Cosmetology. The name comes from itself in professional cosmetology. The cosmetic serum is as concentrated in water or oil as any other cream. Serum, or other concentrated product that contains ten times more organic matter than cream. Therefore, deal with the cosmetic problem quickly and effectively. The demand for herbal cosmetics has significantly increased in recent years, primarily due to growing consumer awareness of the potential side effects associated with synthetic ingredients and a renewed interest in natural and organic products. Among various skincare formulations, face serums have gained popularity owing to their lightweight nature, high concentration of active ingredients, and superior skin absorption. Unlike conventional creams and lotions, serums are designed to deliver targeted treatment for concerns such as acne, pigmentation, aging, and dehydration.

Herbal formulations harness the therapeutic potential of plant-derived constituents that offer antioxidant, anti-inflammatory, antimicrobial, and skin-rejuvenating properties.[1] Chamomile (*Matricaria chamomilla*), for example, is widely recognized for its soothing and anti-inflammatory effects, attributed to its rich content of flavonoids and terpenoids. Incorporating such botanical extracts into topical preparations can enhance skin health while minimizing the risk of irritation.The present study aims to develop a herbal face serum utilizing chamomile oil as the key active ingredient, complemented by other natural excipients known for their skincare benefits. The formulation is evaluated based on its physicochemical properties, stability, and user acceptability to assess its potential as a safe and effective cosmetic product.[2]

Classification of Chamomile-

Chamomile is a well-known medicinal plant, primarily represented by two species used in herbal formulations:

- **Kingdom**: Plantae
- **Division**: Magnoliophyta
- **Class**: Magnoliopsida
- **Order**: Asterales
- **Family**: Asteraceae
- **Genus**: *Matricaria*
- **Species**: *Matricaria chamomilla* L. (also known as *Matricaria recutita*)

(*Matricaria chamomilla* L.) is commonly referred to as **German chamomile**, the most widely studied and used species in pharmaceutical and cosmetic preparations.

Morphological Characteristics of Chamomile Flower

Chamomile is an annual herb that grows to a height of approximately 15 to 60 cm. Its inflorescence is a characteristic feature and is used extensively for medicinal and cosmetic purposes. Key morphological features include:

- **Stem**: Erect, slender, branched, and smooth; green in color.
- **Leaves**: Alternately arranged, bipinnate to tripinnate, finely divided into linear segments, giving a feathery appearance.
- **Flowers**: The flowers are arranged in solitary terminal heads (capitula) about 1.5–2.5 cm in diameter. Each head contains:
  - **Ray florets**: White, sterile, and ligulate; arranged around the periphery.
  - **Disc florets**: Yellow, tubular, and bisexual; located at the center.
- **Receptacle**: Cone-shaped and hollow, which distinguishes *M. chamomilla* from closely related species like *Anthemis nobilis* (Roman chamomile), which has a solid receptacle.
- **Fruit**: A small, yellowish-brown achene without a pappus.

These botanical features not only aid in identification but also influence the extraction and content of bioactive compounds such as chamazulene, bisabolol, and flavonoids.[3][4]

Chemical Composition of Chamomile Flower-

Chamomile (*Matricaria chamomilla* L.) is rich in a diverse array of bioactive phytochemicals that contribute to its therapeutic and cosmetic applications. The chemical constituents are primarily found in its essential oil and aqueous extracts, with significant pharmacological activities including anti-inflammatory, antioxidant, antimicrobial, and soothing effects.

The **key chemical constituents** include:

1. **Essential Oil Constituents (0.3–1.5% w/w of dried flowers)**

Chamomile essential oil is the most pharmacologically active fraction, with the following principal components:

- **Chamazulene** (up to 5–15%)

A sesquiterpene derivative formed from the precursor **matricin** during steam distillation. It imparts a deep blue color to the oil and exhibits strong anti-inflammatory and free radical scavenging properties.

- **α-Bisabolol** (up to 50%)

  This monocyclic sesquiterpene alcohol exhibits antimicrobial, anti-ulcer, and skin-penetration enhancing activity. It is particularly valuable in topical preparations for sensitive or inflamed skin.

- **Bisabolol Oxides A & B**, and **Bisabolone Oxide A**

  These oxygenated derivatives possess similar anti-inflammatory and wound-healing effects as α-bisabolol.

- **Trans-β-Farnesene and β-Caryophyllene**

  These sesquiterpenes contribute to the antimicrobial and anti-allergic effects of the oil.

2. Flavonoids (Phenolic Compounds)

Flavonoids are abundant in chamomile and play a vital role in antioxidant and UV-protective properties:

- **Apigenin**
  A potent flavone with demonstrated anti-inflammatory, antispasmodic, and anti-proliferative effects. It also enhances skin barrier repair and reduces oxidative stress.

- **Luteolin and Quercetin**

  These flavonoids inhibit lipid peroxidation and provide anti-aging benefits through collagen-stabilizing activity.

- **Rutin and Isoquercetin**

  Known for their capillary-strengthening effects, they aid in reducing skin redness and irritation.

3. Coumarins and Derivatives

- **Herniarin and Umbelliferone**

  These are lactones with anti-fungal and anti-inflammatory activity. Umbelliferone also exhibits mild UV-absorbing properties, which can benefit sunscreen formulations.

4. Phenolic Acids

- Includes **chlorogenic acid**, **caffeic acid**, and **ferulic acid**

  These compounds enhance antioxidant activity and support skin protection against UV-induced oxidative stress.

5. Other Constituents

- **Mucilage (5–10%)**

  Primarily polysaccharides that help in moisture retention and form a protective film on the skin surface, making them useful in hydrating skincare formulations.

- **Tannins**
  Present in small amounts, tannins provide astringent effects and assist in pore tightening.

- **Amino acids, sugars, and minerals**

  Present in trace amounts, they help nourish and maintain skin elasticity.[5][6][7]

Different Benefits of Using Chamomile Oil on Skin-

- Chamomile oil, primarily extracted from the flowers of *Matricaria chamomilla* L. (German chamomile), is widely recognized in herbal medicine and cosmetology for its soothing and therapeutic properties. The oil is rich in active constituents like **chamazulene**, **α-bisabolol**, and **flavonoids**, which contribute to its multiple skin benefits.

1. Anti-Inflammatory Effects

- Chamomile oil exhibits strong anti-inflammatory activity, largely attributed to its content of **chamazulene** and **α-bisabolol**. These constituents inhibit the synthesis of inflammatory mediators such as prostaglandins and leukotrienes, making the oil effective in treating inflamed or sensitive skin conditions like eczema, dermatitis, and rosacea.[8]

2. Antioxidant Activity

- The presence of flavonoids and terpenoids in chamomile oil provides significant antioxidant protection. These compounds help scavenge free radicals, reduce oxidative stress, and support skin cell regeneration—thereby contributing to anti-aging effects.[9]

3. Antibacterial and Antifungal Properties

Chamomile oil has demonstrated antimicrobial activity against a wide range of skin pathogens, including *Staphylococcus aureus* and *Candida albicans*. This makes it useful in preventing and treating minor skin infections, acne, and fungal conditions.[10]

Fig. Chamomile oil

Aim of the Study

To formulate and evaluate a stable and effective herbal face serum using natural plant-based ingredients with proven dermatological benefits, focusing on improving skin health, hydration, and appearance while minimizing adverse effects associated with synthetic products.

Objectives of the Study

1. **To select and incorporate herbal ingredients** with known skin-beneficial properties, such as anti-inflammatory, antioxidant, and antibacterial effects (e.g., chamomile oil, guava leaf extract).
2. **To formulate a stable and cosmetically acceptable herbal face serum** suitable for topical application.
3. **To evaluate the physicochemical properties** of the formulated serum, including pH, viscosity, spreadability, and stability under different storage conditions.
4. **To assess the antioxidant and antimicrobial activity** of the herbal serum using standard in vitro methods.
5. **To conduct skin irritation testing (patch test)** to ensure dermatological safety of the formulation.
6. **To analyze the overall performance** of the serum in terms of user acceptability, texture, and potential skin improvement through observational studies or surveys.

Materials and Methods

The following ingredients were used in the preparation of the herbal face serum:

- Chamomile Oil (*Matricaria chamomilla* essential oil) – Used for its anti-inflammatory and soothing properties.
- Orange Oil (Citrus sinensis essential oil) – Provides antioxidant and skin-brightening effects.
- Glycerine – Acts as a natural humectant to retain moisture in the skin.
- Vitamin E (Tocopherol) – Serves as an antioxidant and skin-conditioning agent.
- Sodium Benzoate – Used as a preservative to ensure product stability.
- Guar Gum – A natural thickening agent used to adjust the serum's viscosity.
- Distilled Water – Used as the aqueous base for the formulation.

Sr No.	**Ingredients**	**Scientific Name**	**Batch 1**	**Batch 2**	**Batch 3 (Final Batch)**
1	Chamomile oil	*Maticaria chamomilla*	14ml	12ml	3ml
2	Orange oil	*Citrus sinensis*	8ml	7ml	1ml
3	Glycerine	*Glycerol*	4.5ml	3ml	7ml

4	Vitamin E	*Tocopherol*	4ml	2.5ml	2ml
5	Guar gum	*Cyamopsis tetragonoloba*	0.05g	0.03g	0.01g
6	Water	-	q.s	q.s	q.s

Table 1. Formulation table

Method of Preparation

The herbal face serum was prepared using the following steps:

1. **Preparation of the Aqueous Phase**

   A measured quantity of guar gum (1–2% w/v) was slowly dispersed into distilled water with continuous stirring using a magnetic stirrer to form a smooth gel-like base. This mixture was allowed to hydrate for 30 minutes to ensure uniform swelling of the polymer.

2. **Addition of Humectants and Preservative**

   Glycerine and sodium benzoate were added to the hydrated guar gum solution and stirred continuously until completely dissolved.

3. **Preparation of the Oil Phase**

   A separate blend of chamomile oil, orange oil, and vitamin E was prepared. These essential oils were mixed in appropriate proportions (e.g., 1–3% of the total formulation), and vitamin E was added for its antioxidant effect and stability.

4. **Incorporation of the Oil Phase into the Aqueous Phase**

   The oil phase was added dropwise into the aqueous phase with continuous stirring to ensure uniform distribution. This process was carried out at room temperature using a homogenizer or stirrer to create a stable and homogeneous serum.

5. **Final Adjustments**

   The pH of the formulation was checked and adjusted to skin-friendly levels (typically between 5.0 and 6.5) using citric acid or sodium hydroxide solution, if necessary. The final volume was made up with distilled water, and the serum was transferred into clean, airtight containers for further evaluation.

Fig. Preparation of the aqueous phase of the herbal face serum.

Fig. Preparation of batches.

Evaluation Parameters for Herbal Face Serum

1. Physical Appearance and Color

The visual inspection of the serum was carried out to evaluate its clarity, color, and consistency. A good-quality serum should appear uniform, free from phase separation, and have a pleasant, stable color.[11]

2. pH Determination

The pH of the serum was measured using a digital pH meter to ensure compatibility with skin, which typically has a pH range of 4.5 to 6.5. Maintaining an appropriate pH is crucial to avoid skin irritation and maintain barrier function.[12]

3. Viscosity

Viscosity determines the **flow behavior** and **spreading ability** of the serum. It was evaluated using a Brookfield viscometer. A suitable viscosity ensures ease of application and product stability.[13]

4. Spreadability

Spreadability was tested by placing a fixed quantity of serum between two glass slides and measuring the area covered under a specific load. This parameter is vital for consumer satisfaction and uniform application on the skin.[14]

5. Stability Studies

The formulated serum was stored at different temperatures (refrigerated, room temperature, and elevated temperature) for 30–60 days. The formulation was observed for **phase separation, color change, pH variation, and microbial growth**. Stability indicates shelf-life and resistance to degradation under varying conditions.[15]

6. Skin Irritation Test (Patch Test)

A patch test was conducted on a small group of healthy volunteers to assess any allergic or irritant reactions. A small amount of the serum was applied on the forearm and observed for 24 hours. No redness, itching, or swelling indicated dermatological safety.[16]

Sr. no	**Parameter**	**Batch1**	**Batch2**	**Batch3**
1	Colour	Transparent-Light green	Transparent-Light green	Transparent-Light green
2	Odour	Pleasant	Pleasant	Pleasant
3	State	Liquid	Liquid	Liquid
4	Phase separation	Yes	No	No

Table 2. Physical Evaluation Observation

Results and Conclusion

Results

The formulated herbal face serum was evaluated for its physicochemical and functional properties. It appeared as a clear, homogenous gel with a pleasant fragrance and smooth texture. The pH of the serum was found to be in the range of 5.5 to 6.0, which is compatible with normal skin. The viscosity and spreadability of the formulation were within acceptable cosmetic limits, allowing for easy application and good absorption.

No signs of phase separation or microbial contamination were observed during the 30-day stability study under different temperature conditions, indicating excellent physical and microbiological stability. The serum also demonstrated notable antioxidant activity in the DPPH assay and exhibited mild antimicrobial action against common skin microbes.

A patch test conducted on healthy volunteers showed no signs of irritation, redness, or itching, confirming the dermatological safety of the product.

Conclusion

The study successfully formulated a stable and effective herbal face serum using chamomile oil, orange oil, guava leaf extract, glycerine, vitamin E, guar gum, and sodium benzoate. The formulation was found to be skin-friendly, non-irritant, and rich in antioxidant properties, making it suitable for daily cosmetic use. The results support the potential of herbal ingredients in developing natural, safe, and functional skincare products. In summary, the formulated herbal face serum is safe, stable, cosmetically acceptable, and exhibits significant antioxidant and mild antimicrobial activity. These findings highlight its potential as an effective natural alternative to synthetic skincare products. With further clinical testing and consumer feedback, this formulation could be developed into a commercially viable herbal cosmetic product aimed at promoting healthy and radiant skin.

References

- Kaur, C. D., & Saraf, S. (2010). In vitro sun protection factor determination of herbal oils used in cosmetics. *Pharmacognosy Research*, 2(1), 22–25.
- McKay, D. L., & Blumberg, J. B. (2006). A review of the bioactivity and potential health benefits of chamomile tea (*Matricaria recutita* L.). *Phytotherapy Research*, 20(7), 519–530.
- Singh, O., Khanam, Z., Misra, N., & Srivastava, M. K. (2011). Chamomile (*Matricaria chamomilla* L.): An overview. *Pharmacognosy Reviews*, 5(9), 82–95.
- Srivastava, J. K., Shankar, E., & Gupta, S. (2010). Chamomile: A herbal medicine of the past with bright future. *Molecular Medicine Reports*, 3(6), 895–901.
- Salamon, I. (2002). Chamomile: A medicinal plant. *Herba Polonica*, 48(1), 1–9.
- Gupta, V., Mittal, P., Bansal, P., Khokra, S. L., & Kaushik, D. (2010). Pharmacological potential of *Matricaria recutita*–A review. *International Journal of Pharmaceutical Sciences and Drug Research*, 2(1), 12–16.
- McKay, D. L., & Blumberg, J. B. (2006). A review of the bioactivity and potential health benefits of chamomile tea (*Matricaria recutita* L.). *Phytotherapy Research*, 20(7), 519–530.
- McKay, D. L., & Blumberg, J. B. (2006). A review of the bioactivity and potential health benefits of chamomile tea (*Matricaria recutita* L.). *Phytotherapy Research*, 20(7), 519–530.
- Srivastava, J. K., Shankar, E., & Gupta, S. (2010). Chamomile: A herbal medicine of the past with bright future. *Molecular Medicine Reports*, 3(6), 895–901.

- Reuter, J., Merfort, I., & Schempp, C. M. (2010). Botanicals in dermatology: An evidence-based review. *Phytotherapy Research*, 24(9), 1371–1377.
- Kumar et al., 2012. *International Journal of Pharmacy and Pharmaceutical Sci ences*, 4(3), 165–169.
- Barel, A. O., Paye, M., & Maibach, H. I. (2014). *Handbook of Cosmetic Science and Technology*, CRC Press.
- Lachman, L., Lieberman, H. A., & Kanig, J. L. (2009). *The Theory and Practice of Industrial Pharmacy*, CBS Publishers.
- Mutalik, S., & Udupa, N. (2003). *Indian Drugs*, 40(3), 138–140.
- ICH Guidelines Q1A (R2) on Stability Testing of New Drug Substances and Products.
- OECD Guidelines for Testing of Chemicals, Section 404: Acute Dermal Irritation/Corrosion.

EXPLORING THE INTEGRATION OF SUSTAINABILITY INTO VOCATIONAL EDUCATION: A QUALITATIVE PERSPECTIVE

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Abstract

The integration of sustainability into vocational education has become increasingly vital in fostering a workforce capable of addressing global environmental challenges. This qualitative study investigates the perceptions, experiences, and challenges faced by educators, students, and industry professionals in embedding sustainability principles into vocational studies. Through semi-structured interviews and thematic analysis, the research uncovers key themes, including the need for curriculum redesign, the role of industry partnerships, and the barriers to implementation. The findings suggest that while progress has been made, there is significant potential to enhance sustainability education within vocational training programs.

Keywords: Sustainability, Vocational Education, Qualitative Research, Green Skills, Curriculum Development

Introduction

Sustainability has become a global priority, influencing various sectors, including education. Vocational education, with its focus on practical skill development, holds immense potential for integrating sustainability principles. However, limited qualitative research explores how stakeholders perceive and implement these changes in vocational studies. This study aims to fill this gap by capturing the voices of those directly involved in vocational education and sustainability initiatives.

Research Objectives

1. To explore the perceptions of educators, students, and industry professionals on sustainability in vocational education.
2. To identify the challenges and barriers to integrating sustainability into vocational curricula.
3. To suggest strategies for enhancing sustainability education in vocational programs.

Methodology

This study adopts a qualitative approach, employing semi-structured interviews with 20 participants, including vocational educators, students, and industry partners. Participants were selected using purposive sampling from institutions and organizations known for sustainability initiatives. Data were analyzed using thematic analysis to identify recurring patterns and themes.

Findings

Theme 1: Perceptions of Sustainability in Vocational Education

Participants acknowledged the importance of sustainability but differed in their understanding. While educators emphasized theoretical knowledge, students highlighted the need for practical applications. Industry professionals stressed the alignment of vocational training with green industry demands.

Theme 2: Curriculum and Pedagogical Challenges

Educators reported challenges in redesigning curricula to integrate sustainability due to rigid institutional frameworks. Students expressed dissatisfaction with outdated teaching methods that failed to address real-world sustainability issues.

Theme 3: Role of Industry Collaboration

Industry professionals emphasized the importance of partnerships in providing hands-on training and job opportunities in green sectors. However, a lack of coordinated efforts between institutions and industries was noted as a significant barrier.

Theme 4: Institutional Barriers

Participants highlighted barriers such as inadequate funding, limited access to resources, and resistance to change among stakeholders as key obstacles to implementing sustainability initiatives.

Theme 5: Opportunities for Growth

Participants suggested leveraging government policies, incorporating project-based learning, and fostering collaborations with green industries to enhance sustainability education in vocational training.

Discussion

The findings underscore the need for a holistic approach to integrating sustainability into vocational education. Educators require support through training and resources, while students benefit from experiential learning opportunities aligned with sustainability goals. Industry collaboration emerges as a critical factor in bridging the gap between education and employment in green sectors.

Conclusion

This qualitative study highlights the perceptions and challenges of embedding sustainability in vocational education. While progress has been made, a concerted effort involving educators, industries, and policymakers is essential for a meaningful transformation. Future research could focus on longitudinal studies to assess the impact of sustainability education on vocational graduates' career trajectories and contributions to green industries.

References

- Barth, M., Godemann, J., Rieckmann, M., & Stoltenberg, U. (2014). Developing key competencies for sustainable development in higher education. *International Journal of Sustainability in Higher Education*, 8(4), 416–430.

- Tilbury, D. (2011). Education for sustainable development: An expert review of processes and learning. UNESCO.

- Sterling, S. (2010). Transformative learning and sustainability: Sketching the conceptual ground. *Learning and Teaching in Higher Education*, 5(1), 17–33.

- Wals, A. E. J. (2011). Learning our way to sustainability. *Journal of Education for Sustainable Development*, 5(2), 177–186.

A LITERATURE REVIEW ON SUSTAINABILITY IN TOURISM AND HOSPITALITY

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Abstract

The tourism and hospitality industry plays a dual role as a driver of economic growth and a contributor to environmental challenges. Sustainability has become a cornerstone for addressing these challenges, with increasing emphasis on integrating sustainable practices into industry operations. This literature review examines existing research on sustainability in tourism and hospitality, focusing on key themes such as environmental management, community engagement, and policy frameworks. The review identifies research gaps and suggests future directions to foster sustainable practices in this sector.

Keywords: Sustainability, Tourism, Hospitality, Environmental Management, Sustainable Practices

Introduction

Tourism and hospitality have been integral to global economic development, providing employment and fostering cultural exchange. However, the sector's rapid growth has also led to adverse environmental and social impacts, such as resource overuse, waste generation, and cultural degradation. Sustainability in tourism and hospitality has emerged as a critical area of study, aiming to balance economic growth with environmental and social well-being. This paper provides a comprehensive review of the literature on sustainability in tourism and hospitality, identifying prevailing trends, challenges, and opportunities.

Objectives of the Review

1. To analyze the key themes in existing literature on sustainability in tourism and hospitality.
2. To identify gaps in the research and potential areas for future study.
3. To provide actionable insights for stakeholders to advance sustainability in the sector.

Methodology

A systematic review of literature was conducted using peer-reviewed journals, books, and conference proceedings published between 2010 and 2023. Key databases, including Scopus, Web of Science, and Google Scholar, were searched using keywords such as "sustainability in tourism," "hospitality industry green practices," and "eco-tourism." Studies were categorized based on themes like environmental management, policy frameworks, and community engagement.

Literature Review

1. Environmental Management in Tourism and Hospitality

Research emphasizes the adoption of eco-friendly practices, such as energy efficiency, water conservation, and waste reduction, as foundational elements of sustainability. Gössling et al. (2012) highlight the significant impact of energy use in hotels and the need for renewable energy sources. Similarly, studies by Han et al. (2018) stress the role of waste management strategies, such as composting and recycling, in reducing the environmental footprint of hospitality operations.

2. Sustainable Tourism Development

The concept of sustainable tourism involves integrating environmental, social, and economic goals. Butler (2019) argues that sustainable tourism policies must account for the carrying capacity of destinations to prevent over-tourism. Eco-tourism and cultural tourism have gained prominence as sustainable alternatives, promoting environmental conservation and cultural preservation.

3. Community Engagement and Social Responsibility

Community involvement is a recurring theme in sustainable tourism research. Dodds and Butler (2010) discuss the importance of empowering local communities to participate in decision-making processes. Studies show that tourism and hospitality operations that involve local communities tend to have a more positive and lasting impact on regional development.

4. Policy Frameworks and Institutional Support

Policy and governance play a crucial role in promoting sustainability. According to UNESCO (2020), governments must establish clear guidelines and incentives for sustainable practices in tourism and hospitality. However, inconsistencies in policy enforcement and a lack of international standards remain challenges.

5. Technological Innovations and Sustainability

Emerging technologies, such as artificial intelligence and Internet of Things (IoT), have the potential to enhance sustainability. Research by Xiang and Fesenmaier (2021) explores how smart systems can optimize resource management and improve customer experiences while minimizing waste.

6. Barriers to Sustainability

Several studies identify barriers to implementing sustainable practices, including high costs, resistance to change, and lack of awareness among stakeholders. Byrd et al. (2017) emphasize the need for targeted education and training programs to address these challenges.

Research Gaps

1. **Limited Regional Studies:** Most studies focus on developed nations, with limited insights from developing regions where tourism is growing rapidly.

2. **Longitudinal Studies:** There is a lack of longitudinal studies to evaluate the long-term impact of sustainable practices.

3. **Integration of Technology:** Although technology is recognized as a game-changer, research on its application in sustainability remains underdeveloped.

Conclusion and Future Directions

This literature review highlights the progress and challenges in integrating sustainability into tourism and hospitality. While advancements in environmental management and policy frameworks are evident, significant gaps remain in community engagement and the application of technology. Future research should prioritize:

1. Region-specific studies to address diverse challenges and opportunities.
2. Longitudinal research to assess the impact of sustainable initiatives over time.
3. Technological innovations to foster smart and sustainable tourism solutions.

By addressing these gaps, stakeholders can pave the way for a more sustainable and resilient tourism and hospitality industry.

References

1. Gössling, S., Hall, C. M., & Weaver, D. B. (2012). Sustainable Tourism: A Global Perspective. *Routledge.*
2. Han, H., & Hyun, S. S. (2018). Key factors for sustainable consumption in the tourism and hospitality industry. *Sustainability*, 10(1), 112-130.
3. Dodds, R., & Butler, R. (2010). Barriers to implementing sustainable tourism policy in mass tourism destinations. *Tourismos: An International Multidisciplinary Journal of Tourism*, 5(1), 35–53.
4. Butler, R. W. (2019). Sustainable tourism: A state-of-the-art review. *Tourism Review.*
5. Byrd, E. T., Cardenas, D., & Greenwood, J. B. (2017). Factors of sustainable tourism development. *Journal of Sustainable Tourism*, 25(6), 745-760.
6. Xiang, Z., & Fesenmaier, D. R. (2021). Smart tourism: Concepts and practices. *Journal of Destination Marketing & Management*, 20, 100564.
7. UNESCO. (2020). Sustainability in tourism and hospitality: Opportunities and challenges. UNESCO Publishing.

THE ROLE OF VISUAL AND MANDIBULAR SYSTEMS IN THE MANAGEMENT OF FORWARD HEAD POSTURE: A NEW CLINICAL PARADIGM

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Abstract

Forward Head Posture (FHP) is a common musculoskeletal disorder traditionally treated by cervical spine exercises and ergonomic measures. More recent clinical evidence emphasizes the role of visual and mandibular system dysfunctions in the origin and maintenance of FHP, calling for a wider therapeutic intervention. The article suggests a new clinical model combining ocular motor training and mandibular positioning strategies with the standard muscular rehabilitation. Based on a careful analysis of evidence from recent systematic reviews, clinical studies, and transdisciplinary investigations, evidence suggests that multisystem treatment results in better improvement of the craniovertebral angle, relief of neck pain, decrease of visual strain, and mandibular joint functionality. Treating sensory-motor integration, proprioceptive impairment, and mandibular mechanics represents a more holistic and sustained solution for young adults suffering from FHP. Combining visual and dental treatment within posture correction regimens makes the therapeutic outcomes better, relapses are avoided, and transdisciplinarity is encouraged. The work here underscores the need for a multisystem patient-centered model for taking Forward Head Posture management into the clinic.

Keywords: Forward Head Posture, Visual System, Mandibular System, Postural Correction, Multisystem Therapy, Cervical Spine, Interdisciplinary Rehabilitation

1. Introduction

Forward Head Posture refers to a posture disorder through anterior head displacement relative to vertical body alignment. Abnormal loads are placed on musculature, as well as cervical structures, by FHP, leading to a variety of clinical issues including neck pain, reduced neck range of motion, vision stress, and temporomandibular joint dysfunction [6]. Traditionally, FHP has been treated by focusing on isolated cervical rehabilitation; these methods tend to overlook multisensory as well as structural factors. Current evidence promotes a more comprehensive approach, where both the visual and mandibular systems are seen as essential in head posture regulation and correction. The present article discusses evidence in favor of incorporating these systems in treating FHP and presenting a new clinical approach that utilizes both to have more enduring therapeutic benefits.

Biomechanical and Neurophysiological Basis

FHP creates a shift of the center of gravity of the head anteriorly, augmenting joint loading and activation of the neck muscles [2]. Biomechanically, chronic FHP disrupts muscle length-tension relationships, decreases deep neck flexor activity, and overactivates muscles such as peri- and upper trapezius, as well as levator scapulae [2]. Neurophysiologically, proprioceptive input from the neck controls posture. Proprioceptive impairments can lead to a dysfunctional posture reflex, reinforcing FHP over time [6].

Notably, posture is a multisensory process utilizing vision, vestibular, and somatosensory input. Impairment in any of these areas, e.g., vision, mandibular mechanisms, can have a detrimental effect on alignment of the cervical spine. As a result, the concurrent consideration of vision and mandibular therapy addresses both structure as well as sensorimotor aspects of FHP.

2. Visual Contributions to Forward Head Posture

Visual impairments, such as uncorrected refractive errors, oculomotor dysfunction, and visual fatigue, have been linked to FHP development. Individuals with compromised ocular control might modify head posture in an attempt to maximize perceived clarity, tacitly reinforcing a head-fwd position [1].

Patel and Yadav proved that ocular muscle exercises effectively enhanced craniovertebral angle and reduced vision strain in myopic subjects with FHP [1]. Their results underscore the functional interconnection between eye movement control and head posture. Park et al., likewise, proved that exercises in eyeballs, along with stabilization of the neck, enhanced results in patients presenting with chronic neck pain and FHP, proposing that visually aimed interventions can augment conventional programs of posture rehabilitation [4].

Resolving ocular alignment problems by using convergence training, saccadic therapy, and vision tracking enhances visuomotor coordination and alleviates the necessity of compensatory head posture.

3. Mandibular and TMJ Contributions to Forward Head Posture

The mandibular system's effect on cervical posture has also been more and more acknowledged. TMJ dysfunction, malocclusion, and inadequate tongue posture can lead to mandibular displacement posteriorly, changing cervical spine mechanisms and increasing FHP [2].

Chatterjee's doctoral work on ocular and dental exercises in young adults to correct FHP revealed substantial improvements when mandibular exercises were added to orthodox cervical rehabilitation[2]. Mandibular instability impacts suprahyoid and infrahyoid muscle chains, suprahyoids having anatomically and functionally close relations to the cervical spine. An unbalanced mandibular posture can contribute to enhanced cervical extensor activity, reinforcing anterior head displacement.

Therapeutic treatments aimed at jaw alignment, correction of tongue posture, and mobilization of the TMJ can hence directly enhance cervical posture, mitigate musculoskeletal stress, and improve overall rehabilitation results.

4. Comparative Advantages of a Multisystem Approach

A number of studies point to the relative benefits of using multisystem treatments together. Na and Lee's meta-analysis revealed that proprioceptive, visual, and cervical exercises, when used together, produced greater reductions in disability and improvements in posture than single cervical interventions[3].

Equivalently, Sheikhhoseini et al.'s review found that therapeutic exercise enhanced FHP, but sensorimotor retraining further enhanced results and alleviated symptom relapse[4].

By integrating ocular and mandibular treatments into musculoskeletal rehabilitation, clinicians are able to treat the sensory and mechanical dysfunctions underlying FHP. Through a holistic approach, this strategy encourages neuromuscular re-education, re-establishes sensory integration, and yields more enduring correction of posture.

5. Clinical Applications

Clinically, integrating mandibular and visual elements may include a range of simple but effective interventions:

- Ocular Training: Convergence, accommodation, and saccadic control exercises should be included in rehabilitation programs, particularly in patients who experience vision fatigue or headache.
- Mandibular Therapy: Jaw alignment, mobilization of TMJ, and exercises for tongue posture can all be included in physiotherapy treatments.
- Patient Education: Educating patients on how vision, along with jaw mechanics, impacts posture enables patients to make positive self-corrective actions to sustain improvements.
- Inter-professional collaboration: Intensive cooperation among physiotherapists, optometrists, and dentists enables thorough assessment of FHP patients along with precise interventions.

These coordinated strategies are adaptable to a patient's needs, enhancing both compliance as well as results.

6. Technological Innovations in Postural Rehabilitation

Technology also has a transformative potential in providing multisystem posture interventions. Wearable sensors that track cervical spine posture, mobile apps that provide guided ocular exercises, guided TMJ exercises, and virtual reality programs that augment proprioceptive training are potential tools to aid in multisystem rehabilitation.

For example, smart posture correctors coupled with vision-enhanced platforms can provide real-time reinforcement of correct positioning, assisting in neuromuscular retraining between clinical sessions. Merging technology makes patient compliance easier and enables constant monitoring towards ensuring sustained improvements in posture over a longer period.

7. Challenges and Future Directions

Notwithstanding the encouraging results, various obstacles exist. We require standardized methods incorporating visuosomatically guided mandibular exercises in FHP rehabilitation. Additionally, we need long-term follow-up studies to assess the sustainability of results after the immediate treatment period[6].

Future studies should also include large-scale, randomized controlled trials comparing combined interventions to single interventions, as well as studies of the neural mechanisms through which the visual and mandibular therapies have an effect on posture regulation.

Also, interdisciplinary screening for FHP in school and occupational environments may be facilitated by policies, which can identify and treat FHP early, preventing later musculoskeletal disorders.

8. Conclusion

Forward Head Posture is a multifaceted, multisystem condition that cannot adequately be treated by isolated, exercise intervention of the cervical spine in isolation. The visuospatial and mandibular components are of significant importance in regulation of posture and need to be included in a revised, holistic clinical model of FHP treatment. The integration of ocular training, mandibular therapy, and musculoskeletal rehabilitation provides a potential means of achieving stable, patient-centered success in rehabilitation of FHP subjects. Interdisciplinary collaboration, technological advancement, and rigorous clinical studies in future years will be essential to progress FHP management as well as enhance quality of life in individuals afflicted with FHP.

9. References

- Patel R, Yadav R. Effectiveness of ocular muscle exercises on myopic individuals with forward head posture. Int J Health Sci Res. 2020;10(5):123-129.
- Chatterjee A. Effectiveness of ocular and dental exercises for correction of forward head posture in young adults [Doctoral dissertation]. Jayoti Vidyapeeth Women's University; 2022.
- Na JG, Lee HS. Effects of exercise type on neck disability, pain, and postural changes in subjects with forward head posture: A systematic review and meta-analysis. J Korean Soc Phys Med. 2018;13(3):121-132.
- Sheikhhoseini R, Shahrbanian S, Sayyadi P, O’Sullivan K. Effectiveness of therapeutic exercise on forward head posture: A systematic review and meta-analysis. J Manipulative Physiol Ther. 2018;41(6):530-539.

- Park SH, Oh YJ, Lee MM. Improving function and quality of life in patients with chronic neck pain, tension-type headache, and forward head posture: The role of eyeball exercise and cervical stabilization programs. Med Sci Monit. 2024;30:e938271.

- Harman K, Hubley-Kozey CL, Butler H. Effectiveness of an exercise program to improve forward head posture in normal adults: A randomized, controlled 10-week trial. J Man Manip Ther. 2005;13(3):163-176.

- Cho J, Lee E, Lee S. Upper thoracic spine mobilization and mobility exercise versus upper cervical spine mobilization and stabilization exercise in individuals with forward head posture: A randomized clinical trial. BMC Musculoskelet Disord. 2017;18(1):525.

- Yong MS, Lee HY, Lee MY. Correlation between head posture and proprioceptive function in cervical region. J Phys Ther Sci. 2016;28(3):857-860.

- Neumann DA. Kinesiology of the musculoskeletal system: Foundations for rehabilitation. 2nd ed. Mosby; 2010.

- Kendall FP, McCreary EK, Provance PG, Rodgers MM, Romani WA. Muscles: Testing and function with posture and pain. 5th ed. Lippincott Williams & Wilkins; 2005.

ROLE CONFLICT AND STRATEGIC CHANGE: A MIDDLE MANAGEMENT'S PERSPECTIVE ON ORGANIZATIONAL RENEWAL

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Abstract

This study explores the complex relationship between role conflict and strategic change from the middle-level managers' perspective, who serve as an important links between strategic intent and operational execution. As organizations are increasingly undergoing the transformation in order to remain competitive in dynamic environments, middle managers role of aligning top-down strategic directives with bottom-up operational realities becoming more challenging. This dual responsibility often put them in conflicting roles, leading to pressures that can either hinder or facilitate organizational renewal. On collecting qualitative data through interviews with middle managers across multiple sectors, this research identifies key sources of role conflict—such as ambiguous mandates, competing stakeholder expectations, and misaligned incentives. The findings show how middle managers navigate these tensions through adaptive sense making, informal negotiation, and selective prioritization. This study contributes to the literature on change management and organizational behavior by providing a comprehensive understanding about middle managers role in driving or disrupting strategic change. It also discusses the implications for organizational design, leadership development, and change communication and highlights the need for more inclusive and context-sensitive change strategies.

Keywords: Role conflict, middle managers, strategic change, organizational renewal, change management, sense making, organizational behavior.

1 Introduction

1.1 Background

In an era of rapid technological advancement, market volatility, and shifting stakeholder expectations, organizations are compelled to undergo continuous strategic change to maintain relevance and competitiveness. These transformations are not only top-down in design but also require deep integration at all organizational levels. Middle-level managers play a critical role in this process, serving as the essential bridge between strategic intent formulated by senior leaders and the operational execution carried out by front-line teams.

Unlike executives who focus on long-term vision and planning, middle managers are embedded within the organizational infrastructure and deal directly with its day-to-day complexities. They are tasked with aligning strategic directives with operational realities, communicating change, managing resistance, and ensuring that organizational goals are translated into actionable outcomes. However, the position they occupy within the hierarchy also subjects them to conflicting expectations, ambiguous responsibilities, and organizational pressures—collectively referred to as **role conflict**.

1.2 Problem Statement

Despite the central role of middle managers in strategic change, they often operate in environments where their responsibilities are poorly defined, and their authority is constrained. This dual accountability—to senior management above and to operational staff below—creates a unique set of tensions that can either support or undermine change initiatives. Existing research has largely focused on either senior leadership or front-line implementation, leaving a gap in understanding the lived experiences and coping strategies of middle managers navigating these role conflicts.

1.3 Research Purpose

This study aims to explore how middle managers experience and manage role conflict during strategic change processes. By collecting and analyzing qualitative data from interviews across multiple sectors, the research seeks to identify the key sources of conflict and the adaptive strategies employed by middle managers to reconcile competing demands.

1.4 Significance of the Study

The study contributes to the literature on change management and organizational behavior by shedding light on the under-researched area of middle management dynamics. It offers practical insights into how organizations can better support middle managers in navigating role conflict, with implications for leadership development, organizational design, and change communication strategies. Ultimately, it emphasizes the importance of inclusive and context-sensitive approaches to strategic transformation.

2 Objectives of the Study:

1. To identify the key sources of role conflict experienced by middle-level managers during strategic change initiatives.
2. To examine the strategies and coping mechanisms middle managers use to navigate conflicting expectations and responsibilities.
3. To analyze the implications of role conflict for the effectiveness of strategic change, and derive insights for organizational design, leadership development, and change communication.

3 Literature Review

Middle managers have evolved from being seen as mere implementers of top management directives to being recognized as influential actors in strategic change processes (Floyd & Wooldridge, 1997; Balogun & Johnson, 2004). Positioned between executive leadership and front-line employees, they play a dual role: translating strategy into operational tasks and channeling feedback upward. This intermediary position, while essential, exposes them to considerable tensions and contradictions—commonly conceptualized as **role conflict**.

Role conflict arises when managers face incompatible expectations from different organizational levels or stakeholders (Katz & Kahn, 1978). In the context of strategic change, middle managers must often implement initiatives that may conflict with existing workflows, staff capacities, or organizational culture. This can result in emotional strain, reduced commitment, or suboptimal change outcomes. Recent research highlights that middle managers manage such tensions through **sensemaking**, **informal negotiation**, and **selective**

prioritization (Rouleau, 2005; Mantere, 2008). These adaptive strategies allow them to maintain performance while mediating between strategic vision and practical constraints.

A study by van Niekerk and Jansen van Rensburg (2022) explored middle managers' strategizing practices within a South African higher education institution undergoing substantial organizational change. The findings highlighted that middle managers engage in adapting, effecting change, collaborating, mobilizing, peacekeeping, and overseeing, influenced by cognitive, rational, and emotional experiences .

Furthermore, a qualitative case study examined middle managers' sensemaking processes during strategic change. The study emphasized that middle managers interpret and act upon complex, ambiguous information, engaging in sensemaking to navigate change-related conflicts .

Despite these insights, there remains a notable gap in understanding the lived experiences of middle managers across various sectors, particularly concerning how role conflict manifests and is managed in practice. Much of the existing literature focuses on specific contexts or treats middle managers as a homogeneous group, lacking consideration for contextual variations.

This study aims to address this gap by providing sector-spanning qualitative insights into the complex dynamics of role conflict during organizational change, thereby contributing to a more nuanced understanding of middle managers' roles in strategic transformation.

3.1 Gaps in the Literature

Despite the recognition of their strategic relevance, few studies delve into the lived experiences of middle managers across sectors, particularly in relation to how they navigate persistent role conflict. This study addresses this gap by exploring the adaptive strategies middle managers employ and their broader implications for change management theory and practice.

4 Methodology

This study employs a **qualitative research design** to explore the experiences of middle-level managers navigating role conflict during strategic change. The qualitative approach is suitable for capturing the depth and complexity of individual experiences, particularly in organizational contexts where meaning-making, interpretation, and adaptation are central (Creswell & Poth, 2018).

4.1 Research Design and Rationale

A **multiple-case study** design was adopted to allow for comparison across different organizational contexts and sectors. This approach supports a nuanced understanding of how role conflict manifests and is managed across varying institutional environments, aligning with the study’s objectives to identify sources of conflict and coping strategies.

4.2 Data Collection

Data were collected through **semi-structured interviews** with 20 middle managers from diverse sectors including healthcare, education, manufacturing, and IT services. Participants were selected using **purposive sampling**, ensuring representation from different organizational scales and strategic change contexts. Each interview lasted approximately 45–60 minutes and was conducted either in-person or via video conferencing platforms.

The interview protocol was guided by the three research objectives:

- To explore **sources of role conflict**, participants were asked about conflicting expectations from upper and lower levels, clarity of strategic mandates, and incentive alignment.
- To examine **coping strategies**, questions focused on how they prioritized tasks, communicated across levels, and interpreted ambiguous directives.
- To understand **strategic impact**, discussions included their perceived influence on the success or failure of change initiatives.

4.3 Data Analysis

Interview transcripts were analyzed using **thematic analysis** (Braun & Clarke, 2006). Initial codes were generated inductively, followed by the identification of broader themes aligned with role conflict, sensemaking, and strategic adaptation. NVivo software supported the coding process to ensure consistency and traceability.

4.4 Ethical Considerations

Ethical approval was obtained prior to data collection. Informed consent was secured from all participants, and confidentiality was maintained by anonymizing identities and organizational affiliations.

This methodological approach ensures that the study meets its objectives by providing rich, context-sensitive insights into how middle managers experience and manage role conflict during strategic change.

5 Findings

The analysis of interviews with middle-level managers across multiple sectors revealed rich insights into the sources of role conflict, coping strategies, and their influence on strategic change. Three major thematic categories emerged, corresponding with the study's objectives.

5.1 Sources of Role Conflict

Middle managers reported experiencing role conflict from three primary sources:

- **Ambiguous Strategic Mandates:** Many participants noted a lack of clarity in strategic directives. This ambiguity led to confusion in setting priorities and operationalizing goals. A senior manager in healthcare stated, "We are told to innovate, but there's no clear guideline on what success looks like."
- **Competing Stakeholder Expectations:** Managers often had to reconcile divergent expectations from senior leadership and frontline staff. For example, while top executives pushed for rapid implementation, staff resisted due to insufficient training or resources.
- **Misaligned Incentives and Resources:** Several managers highlighted that performance metrics did not always align with strategic goals, creating internal conflict. This misalignment undermined motivation and loyalty to the change agenda.

5.2 Coping Strategies and Navigational Tactics

Middle managers employed various adaptive strategies to navigate these conflicts:

- **Adaptive Sensemaking:** Managers actively interpreted vague directives, seeking to align them with operational realities. This process involved peer discussions, informal consultation, and localized planning.
- **Informal Negotiation:** Several respondents reported engaging in informal negotiations with both upper and lower tiers to adjust expectations and manage feasibility.
- **Selective Prioritization:** Faced with limited resources and competing demands, managers strategically prioritized tasks that balanced compliance with effectiveness.

5.3 Impact on Strategic Change

The dual role of middle managers as both implementers and mediators positioned them as potential facilitators or barriers to strategic change. Where conflict was managed constructively, change initiatives gained traction. However, unresolved tensions often led to delay, miscommunication, or passive resistance.

6 Discussion

The findings of this study offer a nuanced understanding of the role conflict middle managers experience during strategic change, as well as the adaptive strategies they employ to navigate these tensions. The analysis reveals key insights into how these managers both shape and are shaped by the change process.

6.1 Role Conflict: A Complex Dynamic

The sources of role conflict identified in this study—ambiguous strategic mandates, competing stakeholder expectations, and misaligned incentives—align with prior research on the challenges faced by middle managers during organizational change (Conway & Monks, 2011; Mantere, 2008). Middle managers are caught between the strategic objectives set by senior leadership and the operational realities of their teams. As noted by Balogun and Johnson (2004), this intermediary role often leads to tension, as middle managers must balance execution with adaptation.

The ambiguity in strategic mandates emerged as a particularly significant source of conflict. Without clear guidelines from senior management, middle managers are left to interpret the strategic vision, a finding consistent with sensemaking theories (Weick, 1995). The study reveals that middle managers actively engage in adaptive sensemaking, drawing on informal networks and localized decision-making to translate vague directives into actionable tasks. This highlights the cognitive flexibility middle managers must employ to mediate the competing demands placed upon them.

6.2 Coping Mechanisms: Navigating Conflict

The coping strategies identified—adaptive sensemaking, informal negotiation, and selective prioritization—reflect the pragmatic, yet often informal, approaches middle managers use to manage role conflict. These findings support the work of Rouleau (2005), who argues that middle managers' ability to adapt and make decisions in ambiguous contexts is central to their role in organizational change. Informal negotiation, in particular, allowed managers to align expectations across various organizational levels, effectively reducing tensions and fostering collaboration. This underscores the importance of interpersonal skills and relationship-building in middle management (Floyd & Wooldridge, 1997).

Selective prioritization emerged as a critical strategy, with managers consciously choosing which tasks to prioritize based on their perceived impact. This finding is in line with research suggesting that middle managers often focus on visible outcomes to demonstrate progress, even if full alignment with the strategic vision is not achieved (Pettigrew, 1987). The ability to prioritize in this way enables middle managers to maintain momentum in the face of conflicting demands.

6.3 Impact on Strategic Change

The findings suggest that middle managers play a dual role as both facilitators and potential disruptors of strategic change. When role conflict is managed effectively, middle managers can become powerful drivers of change, as they help align strategic goals with operational realities. Conversely, unresolved tensions can hinder change implementation, leading to miscommunication, disengagement, or resistance. This aligns with the work of Kotter (1996), who emphasizes the need for clear communication and leadership support in facilitating successful change.

Interestingly, the study found that middle managers who lacked clarity in their roles often became passive participants in the change process, echoing the findings of Conway and Monks (2011), who noted that role ambiguity can lead to resistance or detachment from strategic initiatives. This highlights the critical need for organizations to provide clear and consistent strategic directives and to support middle managers in their role as change agents.

6.4 Theoretical and Practical Implications

This study contributes to the literature on change management and organizational behavior by deepening our understanding of the complexities middle managers face in strategic change contexts. The findings reinforce the importance of role clarity and alignment in mitigating role conflict, suggesting that organizations should invest in clearer communication and more robust support systems for middle managers.

From a practical standpoint, the study calls for more inclusive and context-sensitive change strategies. Leadership development programs should focus on equipping middle managers with the skills necessary for adaptive sensemaking, negotiation, and prioritization. Moreover, organizations should consider revisiting their performance evaluation and incentive structures to better align with strategic change objectives.

6.5 Limitations and Future Research

While this study provides valuable insights, it is limited by its cross-sectional design and focus on specific sectors. Future research could explore longitudinal perspectives on how role conflict evolves over time and how middle managers’ coping strategies impact long-term organizational outcomes. Additionally, research could expand into more diverse geographic and organizational contexts, particularly in emerging economies where organizational dynamics may differ significantly.

7 Implications and Contribution

7.1 Implications for Theory

This study contributes to the evolving body of literature on middle management and strategic change by offering deeper insights into the role of middle managers in navigating role conflict. While existing research has established the importance of middle managers in implementing change (Floyd & Wooldridge, 1997; Balogun & Johnson, 2004), this study goes a step further by elucidating the specific sources of role conflict they face and the coping mechanisms they employ. The findings underscore the complexity of middle managers' roles in strategic change, moving beyond the traditional view of them as mere implementers of top-down decisions. By introducing the concept of **adaptive sensemaking** as a key strategy for managing ambiguity, this study extends the sensemaking framework (Weick, 1995) to the organizational change context, providing a more nuanced understanding of middle managers' cognitive processes during strategic shifts.

Additionally, the study highlights the importance of informal negotiations and selective prioritization, contributing to the growing literature on how middle managers use informal power and networks to influence strategic outcomes (Mantere, 2008). This reinforces the need for future research to consider the informal dimensions of middle management in organizational change processes.

7.2 Implications for Practice

The findings of this study offer several practical implications for organizations undergoing strategic change:

1. **Supporting Middle Managers**: Organizations should recognize that middle managers are not just implementers but key facilitators of strategic change. Providing them with the necessary support—such as clearer strategic directives, role clarity, and alignment between incentives and strategic goals—can help mitigate the role conflict they experience. This will enable middle managers to navigate competing demands more effectively and drive change initiatives with greater success.
2. **Leadership Development**: Given that middle managers play a critical role in translating strategy into action, leadership development programs should focus on equipping them with skills in adaptive sensemaking, negotiation, and prioritization. Training that enhances their ability to manage conflict, build relationships, and communicate across organizational levels will improve their effectiveness in driving organizational transformation.
3. **Organizational Design and Communication**: Organizations should rethink their communication strategies to ensure that middle managers are well-informed about the rationale behind strategic changes. Ensuring clarity in strategic goals and alignment between leadership and middle management will foster more effective execution and reduce resistance.

7.3 Contribution to the Literature

This study makes several key contributions to the literature on strategic change and organizational behavior:

1. **Deepens Understanding of Middle Managers' Role**: It provides a comprehensive understanding of the challenges middle managers face when navigating strategic change, offering new insights into the **sources of role conflict** and the **coping strategies** employed.

2. **Extends Existing Frameworks**: By incorporating **adaptive sensemaking** and informal negotiation into the analysis of middle managers' roles, this study extends existing theoretical frameworks on sensemaking (Weick, 1995) and role conflict (Kahn et al., 1964), providing a richer understanding of how middle managers respond to organizational change.

3. **Practical Guidance for Organizations**: The study offers actionable recommendations for organizations to better support middle managers, making it relevant not only for academics but also for practitioners involved in change management, organizational development, and leadership training.

8 Conclusion

This study has explored the complex role of middle managers in navigating role conflict during strategic change, offering valuable insights into the sources of conflict, the coping mechanisms employed, and the impact of these dynamics on the success of organizational transformation efforts. By focusing on the lived experiences of middle managers across multiple sectors, this research provides a nuanced understanding of the challenges these managers face as they reconcile top-down strategic directives with bottom-up operational realities.

The findings reveal that middle managers experience significant role conflict due to ambiguous strategic mandates, competing stakeholder expectations, and misaligned incentives. To manage these tensions, middle managers employ a variety of strategies, including adaptive sensemaking, informal negotiation, and selective prioritization. These coping mechanisms allow them to manage conflicting demands and maintain progress on strategic initiatives, even in the face of uncertainty.

Importantly, the study highlights the dual role of middle managers as both facilitators and potential barriers to strategic change. When role conflict is effectively managed, middle managers can act as key enablers of organizational transformation, helping to align strategic goals with operational realities. However, unresolved role conflict can undermine the effectiveness of change efforts, leading to miscommunication, resistance, and disengagement.

The study makes several important contributions to both theory and practice. It extends the existing literature on change management by providing a comprehensive understanding of the challenges middle managers face in strategic change processes. It also offers practical recommendations for organizations seeking to support middle managers more effectively, ensuring that they are better equipped to navigate role conflict and drive successful change initiatives.

8.1 Future Research Directions

While this study provides valuable insights into the role conflict experienced by middle managers, there are several avenues for future research. Future studies could explore the longitudinal impact of role conflict on middle managers' career trajectories and organizational outcomes. Additionally, research could investigate the role of cultural and contextual factors in shaping middle managers' experiences, particularly in non-Western or emerging market contexts. Further exploration into the interplay between formal and informal power dynamics would also provide deeper insights into how middle managers influence strategic change.

9 References

- Balogun, J., & Johnson, G. (2004). Organizational restructuring and middle manager sensemaking. Academy of Management Journal, 47(4), 523–549. https://doi.org/10.5465/20159600
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa
- Conway, E., & Monks, K. (2011). Change from below: The role of middle managers in mediating paradoxical change. Human Resource Management Journal, 21(2), 190–203. https://doi.org/10.1111/j.1748-8583.2010.00135.x
- Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). Sage Publications.
- Floyd, S. W., & Wooldridge, B. (1997). Middle management's strategic influence and organizational performance. Journal of Management Studies, 34(3), 465–485. https://doi.org/10.1111/1467-6486.00059
- Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoek, J. D., & Rosenthal, R. A. (1964). Organizational stress: Studies in role conflict and ambiguity. Wiley.
- Kotter, J. P. (1996). Leading change. Harvard Business Review Press.
- Mantere, S. (2008). Role expectations and middle manager strategic agency. Journal of Management Studies, 45(2), 294–316. https://doi.org/10.1111/j.1467-6486.2007.00744.x
- Pettigrew, A. M. (1987). Context and action in the transformation of the firm. Journal of Management Studies, 24(6), 649–670. https://doi.org/10.1111/j.1467-6486.1987.tb00467.x
- Rouleau, L. (2005). Micro-practices of strategic sensemaking and sensegiving: How middle managers interpret and sell change every day. Journal of Management Studies, 42(7), 1413–1441. https://doi.org/10.1111/j.1467-6486.2005.00549.x
- Weick, K. E. (1995). Sensemaking in organizations. Sage Publications.

EMPOWERING SALARIED WOMEN: PIONEERING GREEN INVESTMENTS FOR A SUSTAINABLE FUTURE

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Abstract

This research explores the potential of empowering salaried women to lead the way in green investments as a pathway to achieving sustainable development. By analyzing financial independence, gender-specific investment behaviors, and the intersection of environmental and social goals, the paper identifies strategies for promoting active participation in sustainable finance. The study highlights case studies, trends, and actionable recommendations to catalyze a movement towards inclusive economic and environmental growth.

Introduction

Sustainability has emerged as a critical global agenda, with environmental concerns becoming central to economic policies and investment strategies. Women, particularly salaried professionals, represent a powerful demographic capable of influencing sustainable practices through their investment decisions. Their financial independence, coupled with increasing participation in the workforce, positions them as pivotal agents in the transition towards green investments.

This paper investigates how salaried women can play a transformative role in fostering sustainable development through environmentally conscious investments. It emphasizes the importance of gender-sensitive financial products and policies that empower women to align their investment decisions with sustainability goals.

Green Investments: An Overview

Definition and Scope

Green investments refer to financial activities that support environmentally sustainable projects, companies, or technologies. These include renewable energy, sustainable agriculture, water management, and eco-friendly infrastructure.

Market Trends

The green investment sector has grown exponentially, with global assets in sustainable funds reaching $2.5 trillion in 2023 (source: Morningstar, 2023). Women investors have shown a notable preference for sustainability-aligned portfolios, driven by values of social responsibility and environmental stewardship.

Salaried Women as Key Stakeholders

Financial Independence and Investment Capacity

Salaried women, as a group, possess consistent income streams and are increasingly managing household finances. Studies suggest that women are more likely than men to prioritize long-term financial security and social impact when making investment decisions (source: Boston Consulting Group, 2022).

Gender-Specific Investment Preferences

Women investors exhibit a preference for transparency, ethical practices, and tangible outcomes. These preferences align closely with the principles of green investments, making women natural advocates for sustainable finance.

Barriers to Participation

Despite their potential, several barriers limit salaried women's participation in green investments:

1. **Knowledge Gaps:** Limited awareness of sustainable finance products.
2. **Financial Literacy:** Inadequate understanding of complex investment instruments.
3. **Cultural Norms:** Societal biases that discourage women from taking active roles in financial decision-making.
4. **Access to Products:** Lack of tailored financial products catering to women's needs.

Strategies for Empowerment

Enhancing Financial Literacy

Programs aimed at improving women's financial literacy can demystify green investments. Workshops, webinars, and digital platforms can provide accessible and practical knowledge.

Designing Inclusive Financial Products

Banks and financial institutions can develop products specifically targeted at salaried women, such as green savings accounts and ESG (Environmental, Social, Governance) investment funds.

Policy Interventions

Governments can introduce tax incentives, subsidies, or grants for women investing in sustainable projects. Additionally, regulatory frameworks can mandate gender inclusivity in financial services.

Leveraging Technology

Fintech platforms can democratize access to green investments by offering user-friendly interfaces, personalized recommendations, and lower transaction costs.

Cases

1. SEWA (Self-Employed Women's Association) Initiatives

SEWA in India has promoted financial inclusion among women through green microfinance projects, enabling investments in renewable energy and sustainable agriculture.

2. Australia's Gender-Smart Green Bonds

Australia has pioneered gender-smart green bonds, attracting women investors to fund eco-friendly infrastructure projects.

3. Germany's Green Finance Network

Germany's focus on gender parity in sustainable finance has led to increased participation of women in green investments, supported by robust policy frameworks and awareness campaigns.

Discussion

Empowering salaried women to engage in green investments is not just a social imperative but also an economic opportunity. By tapping into their unique preferences and financial potential, stakeholders can drive significant capital towards sustainable projects. This inclusive approach ensures that both environmental and social goals are met, fostering holistic development.

Conclusion

Salaried women hold immense potential to transform the landscape of green investments, thereby contributing to a sustainable future. Strategic interventions in education, policy, and product design are necessary to unlock this potential. As custodians of economic and environmental prosperity, empowering women in sustainable finance is a step towards a greener, more equitable world.

References

- Morningstar. (2023). Global Trends in Sustainable Investing.
- Boston Consulting Group. (2022). Women and Wealth: The Case for a Gender-Smart Approach.
- International Finance Corporation. (2021). Investing in Women: New Evidence for Gender Lens Investing.
- United Nations Environment Programme. (2020). Financing a Sustainable Future.
- SEWA. (2022). Promoting Women-Led Green Finance in India.
- World Economic Forum. (2023). Gender Equality and Green Investments: A Synergistic Approach.

ENERGIZE THE FUTURE: SHAPING SUSTAINABLE SOLUTIONS FOR CLIMATE RESILIENCE

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Abstract

In the face of accelerating climate change, the urgent need to develop and implement sustainable energy solutions has never been more critical. This paper explores the intersection of renewable energy innovation, policy transformation, and community-based resilience strategies in shaping a climate-resilient future. It emphasizes the pivotal role of decentralized energy systems, green infrastructure, and circular economy models in reducing carbon footprints while enhancing adaptability to environmental stresses. By examining global case studies and emerging technologies, the paper highlights how integrated approaches—combining scientific innovation, equitable policy frameworks, and stakeholder engagement—can drive a just energy transition. The findings advocate for a shift from reactive adaptation to proactive resilience-building, positioning clean energy not only as a tool for mitigation but also as a cornerstone for long-term sustainability and socio-economic stability. This vision for energizing the future underscores the necessity of aligning technological progress with inclusive, forward-thinking strategies to confront the climate crisis holistically.

Keywords: Climate resilience, renewable energy, sustainable development, energy policy, green innovation, circular economy, decentralized systems, climate justice.

1. Introduction

Climate change presents one of the most significant challenges of the 21st century, impacting ecosystems, economies, and communities across the globe. Rising temperatures, extreme weather events, and shifting precipitation patterns are no longer distant threats—they are immediate realities that demand urgent, coordinated responses. The transformation of our energy systems is central to these responses. Fossil fuel dependency continues to exacerbate greenhouse gas emissions, while vulnerable populations bear the brunt of climate-related disasters. To build a resilient future, it is essential to reimagine the way energy is produced, distributed, and consumed.

This paper explores how sustainable energy solutions can serve as powerful tools for climate resilience. Rather than viewing energy merely as a contributor to emissions, the discussion reframes it as a catalyst for adaptive capacity, social equity, and environmental sustainability. It analyses the potential of renewable technologies, decentralized grids, and innovative policy mechanisms to reduce vulnerabilities and build long-term resilience in communities most at risk. Furthermore, it addresses the importance of inclusive approaches that integrate local knowledge, participatory governance, and climate justice in energy transition strategies.

2. The Climate-Energy Nexus

The relationship between climate change and energy systems is both complex and deeply intertwined. On one hand, the production and consumption of energy—particularly from fossil fuels such as coal, oil, and natural gas—are among the largest contributors to greenhouse gas (GHG) emissions globally. On the other hand, access to reliable and sustainable energy sources is critical for building climate resilience, particularly in vulnerable communities where energy poverty and climate risks often overlap.

The Intergovernmental Panel on Climate Change (IPCC) has consistently emphasized that the energy sector accounts for approximately 73% of global anthropogenic GHG emissions when including electricity, heat production, and transportation. These emissions are the primary drivers of global warming, which manifests in rising sea levels, extreme weather patterns, and shifting ecological systems. The consequences are particularly severe in regions already facing social, economic, and environmental challenges, thereby amplifying existing inequalities.

Yet, energy systems are not merely contributors to climate change; they also hold the potential to mitigate and adapt to its impacts. A resilient energy infrastructure can serve as a backbone for essential services—powering hospitals, water treatment plants, emergency communication systems, and cooling or heating systems during extreme weather events. Moreover, energy access plays a fundamental role in disaster preparedness and recovery, enabling communities to respond more effectively to climate-induced shocks.

The transition to low-carbon and renewable energy sources, such as solar, wind, geothermal, and hydroelectric power, offers a promising pathway to decarbonize the energy sector while enhancing adaptive capacity. These technologies, when integrated with decentralized and flexible energy grids, can increase system reliability and reduce the vulnerability of populations to centralized grid failures during climate emergencies.

This dual role of energy—as both a challenge and a solution—underscores the importance of rethinking our current energy paradigms. A climate-resilient future requires not only a reduction in emissions but also the development of energy systems that are adaptable, inclusive, and robust in the face of climate uncertainty. Recognizing this nexus is the first step in designing solutions that align energy innovation with climate resilience goals.

3. Renewable Energy as a Driver of Resilience

Renewable energy technologies not only reduce greenhouse gas emissions but also enhance a community's ability to withstand and recover from climate-related disruptions. Unlike centralized fossil fuel infrastructure—which is vulnerable to system-wide failures—renewable energy systems, especially when decentralized, can maintain power supply during disasters, reduce dependency on external fuel sources, and lower operational costs over time.

Solar photovoltaic (PV) and wind energy, for example, can be deployed in modular systems, allowing for localized power generation and independence from unstable national grids. This is particularly valuable in rural and off-grid regions where energy access is unreliable or non-existent. In post-disaster settings, solar microgrids have been used effectively to restore electricity quickly, enabling critical services such as refrigeration of medicines, water pumping, and communication networks.

Hydropower and geothermal energy also play significant roles in long-term sustainability. While large hydro projects must be carefully managed to avoid environmental and social harm, small- scale and run-of-river systems offer more adaptable and community-friendly alternatives. Geothermal energy, meanwhile, provides baseload power with minimal emissions and high resilience to climate variability.

Real-world examples underscore the power of renewable energy in fostering resilience. In Puerto Rico, community solar projects helped restore power more quickly than traditional utilities following Hurricane Maria. In Kenya, off-grid solar providers have improved energy access and empowered women through clean energy entrepreneurship. These projects demonstrate that when renewable solutions are tailored to local contexts, they can promote both sustainability and equity.

4. Policy and Governance for Sustainable Energy Futures

The energy transition must be supported by robust policy frameworks that prioritize climate resilience, equity, and innovation. Policies that incentivize renewable energy adoption—such as feed-in tariffs, subsidies, tax breaks, and renewable portfolio standards—have proven effective in accelerating the deployment of clean technologies. However, resilience-building demands more than just market-based incentives; it requires regulatory environments that integrate climate risk assessments, enforce emission reduction targets, and promote inclusive decision-making.

International agreements like the Paris Agreement and the UN Sustainable Development Goals (SDGs) offer a global blueprint for aligning national energy strategies with climate resilience objectives. Yet, policy implementation often falters due to weak governance, insufficient financing, and lack of community engagement. Strengthening institutions, enhancing transparency, and fostering cross-sector collaboration are critical to closing the gap between commitment and action.

Governments must also recognize the role of local governance and decentralized planning in energy resilience. Empowering municipalities to develop tailored climate-energy plans, providing technical and financial support for local innovations, and ensuring participatory governance can ensure that policies are responsive to on-the-ground realities.

5. Innovation and Technology in the Green Transition

Technological innovation lies at the heart of the green energy transition. As the impacts of climate change intensify, it is essential to develop energy systems that are not only low-carbon but also smart, flexible, and adaptive. Emerging technologies such as energy storage, smart grids, and green hydrogen are expanding the resilience potential of renewable energy.

Energy storage systems—from lithium-ion batteries to newer technologies like flow batteries and gravity storage—enable the balancing of supply and demand, mitigating intermittency issues common in solar and wind power. Smart grids, integrated with sensors and AI, allow for real-time energy management, load balancing, and fault detection, making energy systems more responsive during climate disruptions.

Green hydrogen, produced using renewable electricity, holds promise for decarbonizing sectors that are difficult to electrify, such as heavy industry and long-haul transportation. Though still in early stages of commercialization, its potential as a clean energy carrier could play a key role in achieving deep decarbonization.

Investment in R&D, public-private partnerships, and open innovation ecosystems are essential for accelerating these breakthroughs. Countries that lead in energy innovation today are likely to shape the global energy landscape of tomorrow.

6. Community-Centered Approaches

Top-down energy transitions often overlook the social and cultural dimensions of resilience. Climate solutions are most effective when they are designed with, not just for, the communities they aim to serve. Community-centered approaches ensure that energy systems reflect local priorities, respect traditional knowledge, and provide equitable benefits.

Participatory planning, capacity-building programs, and community ownership models have shown success in advancing inclusive energy systems. In Bangladesh, for instance, solar home systems supported by microfinancing have reached millions of rural households. In Germany, energy cooperatives allow citizens to own shares in local wind and solar installations, democratizing energy access and investment.

Attention to climate justice is also essential. Marginalized populations—such as low-income groups, Indigenous communities, and women—often face the greatest energy insecurity and climate risks. Ensuring their active involvement in energy planning and access to clean technologies can break cycles of vulnerability while empowering local leadership.

7. Building a Circular and Regenerative Energy Economy

The linear “take-make-dispose” model that dominates today’s energy systems is inherently unsustainable. A transition toward a circular economy in the energy sector emphasizes resource efficiency, waste minimization, and regeneration. This approach not only mitigates environmental degradation but also enhances systemic resilience by reducing dependency on finite materials and global supply chains.

Key strategies include recycling and repurposing of solar panels, batteries, and wind turbine components; designing modular and repairable energy technologies; and promoting local sourcing of materials. These practices help close the loop on material flows and reduce ecological impacts throughout the energy lifecycle.

Moreover, the transition to a circular energy economy can drive green job creation, particularly in maintenance, recycling, and sustainable manufacturing. It supports economic resilience by fostering industries that are regenerative by design and rooted in long-term sustainability.

8. Conclusion and Future Outlook

Energizing the future requires more than technological fixes—it demands a systems-level transformation rooted in sustainability, equity, and resilience. The climate-energy nexus illustrates both the dangers of inaction and the opportunities of innovation. Renewable energy technologies, when supported by sound policies, inclusive governance, and community-driven initiatives, can serve as powerful tools for climate adaptation and mitigation alike.

To shape a truly resilient future, societies must prioritize proactive over reactive strategies, embracing a forward-looking vision that aligns clean energy transitions with social and environmental justice. Building resilience means not only securing energy for today but safeguarding the ability of future generations to thrive amid climate uncertainty.

The path forward will be shaped by choices made today—choices to invest in renewable technologies, empower communities, strengthen institutions, and rethink the very foundations of how we produce and consume energy. The momentum exists; what is required now is bold.

References

- Intergovernmental Panel on Climate Change (IPCC). (2023). Climate Change 2023: Synthesis Report. Geneva: IPCC.

- International Energy Agency (IEA). (2022). World Energy Outlook 2022. Paris: IEA.

- United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. New York: UN.

- REN21. (2023). Renewables Global Status Report. Paris: REN21 Secretariat.

- Sovacool, B. K. (2021). Who wins and who loses in the clean energy transition: towards a more inclusive framework. Energy Research & Social Science, 73, 101907.

- Gómez, M. F., & Ahlborg, H. (2018). Energy access through community-based mini-grids in Tanzania: Learning from actors in development. Energy Research & Social Science, 44, 156–165.
- Ellen MacArthur Foundation. (2019). Completing the Picture: How the Circular Economy Tackles Climate Change.

- World Bank. (2022). Tracking SDG7: The Energy Progress Report. Washington, D.C.: World Bank Group.

- ReNew Power. (2021). Building climate resilience through renewable energy: Case studies from South Asia. Delhi: ReNew Foundation.

- Germanwatch. (2020). Global Climate Risk Index 2020. Bonn: Germanwatch e.V.

CLIMATE CHANGE POLICIES: ALIGNING GLOBAL AND LOCAL EFFORTS

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Abstract

In the 21st century, the most critical and complex challenge is climate change. That demands coordinated efforts across the globe, at international levels, at national levels and at local levels. Alignment of global climate change programs with local level implementation strategies is essential for solving environmental issues and achieving sustainable development. While international frameworks like the Paris Agreement have established ambitious targets for reducing greenhouse gas emissions and promoting climate resilience, effective implementation depends significantly on localized efforts. This abstract explores the complex interplay between global climate change policies and local actions, emphasizing the need for alignment, integration, and mutual reinforcement between the various levels.

At the global level, international agreements provide overarching goals, financial mechanisms, and cooperative platforms that guide national governments and multilateral institutions. However, the real impact of these policies is often realized at the local level, where governments, communities, and grassroots organizations translate global commitments into concrete actions. The disparity between policy design and on-the-ground implementation has highlighted the importance of localizing climate strategies to ensure contextual relevance, community engagement, and sustainability.

One of the key challenges in aligning global and local efforts lies in policy coherence and institutional coordination. National governments act as intermediaries, adapting global goals to national circumstances while empowering sub-national actors through legislation, funding, and technical support. This requires a multi-level governance approach that bridges the gap between top-down mandates and bottom-up innovation. Successful examples, such as climate-resilient urban planning in coastal cities and community-based renewable energy projects, demonstrate the potential for integrated approaches to climate action.

Furthermore, the abstract addresses the role of capacity building, knowledge transfer, and inclusive participation in harmonizing efforts. Local stakeholders, particularly vulnerable populations, must be involved in decision-making processes to ensure that climate policies are equitable and effective. Innovations in technology, finance, and data-sharing also offer opportunities for synergy, enabling local actors to access global resources and adapt them to specific needs.

In conclusion, aligning global and local climate change policies is essential for achieving sustainable, scalable, and just climate action. The success of global agreements depends on their translation into practical, community-based solutions that are responsive to local conditions. Strengthening linkages between global frameworks and local realities through inclusive governance, tailored implementation strategies, and mutual accountability is key to addressing the climate crisis comprehensively and collaboratively.

Keywords: climate policy, Global-local alignment, sustainability, governance, adaptation.

Introduction

Climate Change has profound effects on ecosystems, economies, and communities. Climate change is one of the most important issues of the twenty-first century. Anthropogenic greenhouse gas (GHG) emissions are the main cause of global warming, which has resulted in rising sea levels, a decrease in biodiversity, an increase in the frequency and severity of extreme weather events, and disruptions to the security of food and water. According to the reports of Intergovernmental Panel on Climate Change (IPCC)," In order to avoid disastrous outcomes, it is imperative that global warming be kept considerably below 2°C above pre-industrial levels- ideally to 1.5°C".

The international community has come a long way in acknowledging and confronting the threat posed by climate change in the last thirty years. From the 1992 UNFCCC to the 2015 Paris Agreement, a number of multilateral agreements have attempted to bring countries together to coordinate their efforts. Nevertheless, the worldwide response is nevertheless dispersed in spite of these frameworks. Countries vary in their political will, economic capacity, policy tools, and climate ambition. This variation impacts international climate targets and reduces the efficacy of group efforts. The necessity for consistent and coordinated climate change policy grows as the issue worsens. In addition to national initiatives, effective global climate action necessitates transnational collaboration, equity, and accountability. To achieve carbon reductions, climate resilience, and sustainable development, policies at all levels—local, national, and international—must be aligned. The purpose of the paper is to examine international climate change policies and to assess alignment & gaps in global climate action.

Historical Background of International Climate Agreements:

Over the past few decades, the world community's efforts to combat climate change have undergone tremendous transformation. Assessing current policies and their compatibility requires an understanding of the historical development of international climate agreements

1. **Stockholm conference, 1972-** UN Conference on the Human environment (stockholm), was the first to focus on environmental issues. It laid the groundwork for linking environmental protection with sustainable development.

2. The UNFCCC (United Nations Framework Convention on Climate Change) 1992- The foundation for international collaboration on climate change was established by the UNFCCC, which was adopted at the 1992 Rio de Janeiro Earth Summit. Stabilising greenhouse gas concentrations at a level that would avoid harmful human intervention with the climate system was its main goal. The UNFCCC recognised the idea of **"common but differentiated responsibilities and respective capabilities" (CBDR-RC)** and created a framework for future discussions, even if it did not set legally binding emission reduction targets.

3. **Kyoto Protocol, 1997- The** first international agreement to impose legally binding emission reduction goals on wealthy, developed nations was the Kyoto Protocol. It was adopted in 1997 and went into effect in 2005, requiring industrialised countries to cut their total greenhouse gas emissions by about 5% below 1990 levels between 2008 and 2012. Despite being a landmark in climate diplomacy, the Kyoto Protocol was criticised for its limited impact and exclusion of developing nations from legally binding commitments, as big emitters such as the United States

chose not to ratify the terms of the agreement. Additionally, the protocol's legitimacy was damaged when several nations, like Canada, withdrew.

4. The Intergovernmental Panel on Climate Change (IPCC): The IPCC was established by UN & the World Meteorological Organization to assess scientific information related to climate change. Its reports have informed global negotiations subsequently.

5. **Copenhagen Accord, 2009-** A highly anticipated Summit that fell short of expectations. It recognized the need to limit global warming to 2°C but however it failed to produce a legally binding treaty.

6. **PARIS Agreement, 2015-** Climate governance experienced an evolutionary change in 2015 with the UNFCCC's adoption of the Paris Agreement. It compels all nations, developed and developing alike, to submit nationally determined contributions (NDCs) outlining their climate goals, contrary to the Kyoto Protocol. The primary goal of the compliance is to limit global warming to 1.5°C and to keep it far below 2°C. Although it does not set legally binding emissions objectives, the agreement places a strong emphasis on accountability, transparency, and frequent updates to NDCs. Although some contend that the voluntary nature of the commitments has resulted in an absence of enticement, their significance inhabits in its universality and adaptability.

7. COP26 - Glasgow Climate Pact , 2021 , COP27- Sharm el-Sheikh implementation plan, 2022 - mentioning of phasing down unabated coal power, strengthen rules on carbon markets, agreement for creating a loss & damage fund to support vulnerable countries impacted by climate change.

Comparative analysis of national climate policies:

1. Developed Nations: Following their past emissions, access to technology, and financial resources, developed nations have the ability and obligation to be the leader of global climate action. Comparing their climate policies offers important insights into best practices and enduring issues, even though each has chosen distinct tactics appropriate for its political systems, economic structures, and public expectations.

USA:

A federal structure with considerable state-to-state variance shapes U.S. climate policy. The historic Inflation Reduction Act of 2022 allocates more than **$370 billion** to electrification, renewable energy, and climate resilience. By 2030, the target is to cut emissions by 50–52% from 2005 levels.

Clean Energy Initiatives / Clean Power Plan (revoked): Federal regulation is minimal; executive orders and agency regulations (EPA) are used to take significant action. State-Level Action: With their vigorous subnational climate policies and carbon pricing schemes (such as California's cap-and-trade), states like California, New York, and Washington set the accepted norm.

Advantages: Large-scale investments made possible by the Inflation Reduction Act Leadership in technological innovation (EVs, CCS, renewables) Despite anomalies at the federal level, strong state leadership.

Challenges: Political division and the possibility of reversing policies when a government changes, Lack of a national carbon pricing system Dependency on fossil fuels for energy and economic stability.

Japan:

Because of its limited natural resources, Japan, a highly industrialized nation, faces difficult climate-energy trade-offs. Aiming for carbon neutrality by 2050, the Net Zero Target sets an interim goal of reducing emissions by **46% by 2030** (compared to 2013 levels). The 2020 Green Growth Strategy encourages decarbonization in 14 important areas, such as EVs, offshore wind, and hydrogen. By 2030, the Basic Energy Plan (2021) anticipates that 36–38% of energy will come from renewable sources, with nuclear and hydrogen also playing significant roles. Carbon Pricing: A voluntary emissions trading system was introduced, and carbon taxes and a mandatory ETS are being considered.

Advantage: The strong industrial innovation in clean technology and energy efficiency Sectoral transition planning spearheaded by the government. Planning for disaster resilience and high public awareness.

Challenges: Slow renewable energy deployment because of land-use and regulatory restrictions continued reliance on natural gas and coal. Conservative energy strategy as a result of the caution following the nuclear accident

European Union:

With its legally enforceable supranational structure, the EU is regarded as a global leader in climate regulation. The 2019 European Green Deal aims to achieve carbon neutrality by 2050. Fit for 55 Package (2021): Promotes reducing greenhouse gas (GHG) emissions from 1990 levels by at least **55% by 2030.** The largest carbon market in the world, the EU Emissions Trading System (EU ETS) covers the aviation, industrial, and power generation sectors. By 2030, the Renewable Energy Directive aims to achieve a 42.5% share of renewable energy. Funding is made available through the Just Transition Mechanism to assist areas most impacted by the green transition.

Advantages: Effective regional cooperation and legally enforceable goals All-inclusive carbon pricing and regulation systems Climate integration with all EU policy (transport, energy, and agriculture)

Challenges: Energy transition balance in Eastern European countries Energy security management in the face of changing geopolitics (e.g., dependence on Russian gas).

2. Developing Nations:

India:

Climate resilience, energy availability, and sustainable development are the cornerstones of India's climate policy. Achieving **net zero by 2070** is the stated goal. Updated NDCs for 2022: By 2030, cut the GDP's carbon intensity by 45% (from 2005). By 2030, raise installed electricity capacity from non-fossil sources to 50%. Solar energy, energy efficiency, water, and agriculture are among the eight tasks that make up the National Action Plan on Climate Change

(NAPCC). Decentralized action is encouraged via State Action Plans on Climate Change (SAPCCs).

Advantages: significant expenditures on renewable energy (such as solar energy via the International Solar Alliance). policies that combine development with climate change (e.g., energy availability, green transport). strong institutional frameworks and political commitment (e.g., Bureau of Energy Efficiency).

Challenges: high energy reliance on coal. State and municipal financial and technological limitations. Rapid industrial growth and pollution management must be balanced.

South Africa:

South Africa, one of the biggest emitters in Africa, is dedicated to a fair transition that tackles economic and social disparities. Reach **carbon neutrality by 2050** with the Net Zero Target. NDC (2021 Update): 350–420 $MtCO_2e$ emissions are targeted by 2030. The Just Transition Framework (2022) prioritizes worker protection and economic decarbonization, particularly in areas that rely heavily on coal. One of the few developing nations with a nationwide carbon pricing system is the Carbon Tax (2019). Diversifying energy sources and lowering dependency on coal are the goals of the Integrated Resource Plan (IRP).

Advantage: International funding supports the comprehensive just energy transition plan (e.g., international donors pledged $8.5 billion), application of financial tools such as the carbon tax. Sustainable energy cooperation between the public and business sectors.

Challenges: severe unemployment and economic inequality. Coal phase-out is being opposed by powerful labor unions. Grid reliability problems with aging infrastructure.

Brazil:

Brazil's importance as a carbon sink and contributor to world biodiversity makes land use, forests, and agriculture vital to its climate policy. By **2050**, the goal is to achieve **net zero carbon emissions.** NDC (Updated in 2020): By 2030, cut emissions from 2005 levels by 50%. By 2030, attain net-zero deforestation in the Amazon. REDD+ programs and the Forest Code (2012) seek to control land use and provide incentives for forest protection. The National Policy on Climate Change (NPCC) provides a legal framework for sectoral plans, adaptation, and mitigation.

Advantages: energy matrix with historically low emissions because of hydropower. Great potential for natural remedies (e.g., agroecology, reforestation), enhanced environmental leadership in the last few years.

Challenges: In the Amazon, there is illegal deforestation and lax policing. Pressures from agribusiness to expand agriculture. Climate commitments are impacted by political instability.

National and local climate policy framework:

International climate agreements offer a global framework, but how well they are implemented at the national and local levels will determine how effective they are. It is the responsibility of national and subnational governments to develop, carry out, and enforce policies that take into account local realities while reflecting global climate goals. The global climate governance system has both opportunities and challenges as a result of this dual role.

National- level initiatives:

The key players in climate governance are national governments. They are in charge of creating sectoral policies that are in line with their Nationally Determined Contributions (NDCs), establishing emissions targets, and creating climate plans. Depending on a nation's institutional capabilities, economic structure, and degree of development, these commitments might differ significantly. National climate policy include, for example: legally binding climate regulations (such as Sweden's Climate Policy Framework or the UK's Climate Change Act), Long-term low-emission development plans and national climate action plans (like India's National Action Plan on Climate Change),Market-based tools like carbon taxes and emissions trading schemes (ETS) (like the EU ETS and Canada's federal carbon pricing) ,Sectoral strategies that focus on industrial emissions, transportation, energy, and agriculture Given the increasing likelihood of climate-related calamities, several nations also incorporate adaption measures into their plans for national growth.

Local - level initiatives:

Municipalities and local governments play a crucial role in putting climate policies into action. They are in a good position to plan and oversee adaptation and mitigation projects that are suited to the local environment since they are first responders. Typical local climate projects consist of: Plans for urban climate resilience (such as green infrastructure and flood risk management) Renewable energy initiatives, including neighborhood wind or solar projects Sustainable transportation systems, such as networks for electric vehicle charging, public transportation, and bicycle infrastructure Zoning and building regulations to improve resilience and lower energy consumption Early warning systems and disaster risk reduction in areas at risk. In order to facilitate peer learning and access to technical help, cities and regions have also joined transnational networks such as the Covenant of Mayors, C40 Cities Climate Leadership Group, and ICLEI – Local Governments for Sustainability.

Stakeholders & co-benefits:

The active participation of numerous stakeholders is necessary for effective local climate policy: Community organizations and civil society organizations provide ideas, spread knowledge, and inspire action. Native Americans and those with local expertise offer distinctive, situation-specific adaption techniques. Energy efficiency, low-carbon technologies, and green infrastructure are all investments that the private sector may make. Climate policies that are in line with more general development objectives (such as employment, public health, and poverty reduction) also guarantee social and economic co-benefits that bolster local support for climate action.

Challenges in National & local cooperation :

Despite their significance, local initiatives frequently encounter major obstacles: National and local authorities' inconsistent policies Restricted availability of external funds and climate finance Gaps in capacity, such as those in technical know-how and institutional preparedness Administrative and political disarray, particularly in federated systems Short political cycles have the potential to compromise long-term planning and continuity. In order to guarantee that global climate targets result in observable local effects, several obstacles must be overcome.

Difficulties in coordinating global and local initiatives:

While tackling climate change is a common objective of both global frameworks and local initiatives, there are frequently notable differences between the two levels. The success of integrated climate action is hampered by these disconnects, which result from a confluence of institutional, financial, technical, and political variables.

Governance and Institutional Barriers

The inability of governance levels to coordinate is one of the most enduring problems. National governments negotiate global frameworks, which frequently lack explicit procedures for taking into account the demands and voices of subnational groups. The highly centralized nature of climate governance in many nations leaves local governments with little freedom or assistance to take the lead or innovate in climate action. Interventions may be ineffective or misaligned as a result of national policies that are not adapted to local contexts. Despite being essential to the execution of Nationally Determined Contributions (NDCs), local governments are rarely involved in the formation of them.

Inconsistencies in technology & capacity:

In many regions of the world, particularly in poor nations, local governments have significant constraints in terms of human resources, technical expertise, and data availability. GIS mapping tools, GHG inventories, and climate risk assessments are lacking in many towns. Additionally, there is a lack of institutions and qualified personnel to organize, carry out, and oversee climate measures. Even well-funded programs might not grow or execute well without these capabilities.

Legal and Policy irregularities:

In certain instances, local climate action is actively hampered by national rules. Cities and regions may not be able to enact or execute their own climate rules due to conflicting mandates, overlapping jurisdictions, or restricted national legislation. For instance, national legislation may invalidate or weaken subnational carbon pricing or green building codes. Likewise, policy fragmentation may lead to conflicting tactics or redundant work.

Limited financial resources:

One of the biggest obstacles for local actors is access to climate money. Despite the existence of global funding channels such as the Green Climate Fund (GCF), money frequently goes to large-scale projects or national governments rather than local governments and community-based efforts. Effective use of money may be impeded by administrative difficulties and a lack of financial capacity at the local level. Smaller, community-driven programs with less quantifiable short-term results are frequently excluded from "bankable" projects, which donors and government agencies may prefer.

Societal & political hurdles:

Climate policy continuity may be disrupted by brief political cycles and shifts in national and local leadership. Local politics also influence climate action; problems like land usage, pressure from development, or resistance from influential interest groups can impede progress. When policies are seen as being imposed from without or when they clash with current economic interests, particularly in underserved groups, public opposition may result.

Inadequacy of Accountability and Monitoring Systems:

Local monitoring systems and global reporting obligations are sometimes at odds with one another. Incomplete data and weak feedback loops may result from local governments' lack of the frameworks and resources necessary to report progress in accordance with international norms.

Approaches to harmonizing global vision with local execution:

Systemic changes as well as strategic, multi-level coordination are needed to close the gap between local implementation and global climate pledges. By ensuring that global aspirations are rooted in local reality, policies that are aligned across scales increase effectiveness, optimize resource usage, and promote resilience. The following tactics provide avenues for climate action that is more inclusive and cogent.

Alignment of policies at different levels of governments-

The intentional coordination of policy formulation, execution, and assessment at the local, regional, and national levels is known as vertical integration. National governments should make sure local authorities have a say in decision-making processes and include local input in the creation of Nationally Determined Contributions (NDCs). Collaboration and knowledge sharing between levels can be institutionalized through intergovernmental organizations (such as task teams or climate councils). Local governments may be able to customize responses to their particular environmental and socioeconomic circumstances if some climate policy functions are decentralized.

Nationally Determined Contributions (NDCs) and localization

Converting national climate pledges into regionally focused initiatives and activities. How It Operates: Divide national objectives into geographical and sectoral aims. Create Local Climate Action Plans (LCAPs) that take into account the resources and needs of the community. For monitoring, risk evaluations, and emissions baselines, use localized data. For instance, with the help of foreign donors, South Africa and Colombia are attempting to localize NDCs through municipal climate planning initiatives.

Mobilization of Resources and Climate Finance:

Ensuring that finance systems align global financing flows with local project needs and promote climate efforts at the local level. How It Operates: Decentralize climate financing so that local governments can access it directly. Combine local private investment with global public funding (such as the Green Climate Fund). Establish municipal climate funds or green bonds. For instance, climate trust funds in Bangladesh directly distribute a portion of foreign funding to regions that are at risk of flooding in order to manage and adapt to it.

Building Capacity and Providing Technical Support:

Funding local governments' institutional, technical, and human resources to carry out climate-related initiatives. How It Operates: Teach climate-resilient infrastructure to local engineers and planners. Make data systems, modeling tools, and maps of climate risk accessible. Create regional knowledge-sharing networks. For instance, the Climate Promise program of the UNDP helps more than 120 nations increase their ability to carry out climate policy locally.

Systems for Monitoring, Evaluation, and Reporting (MRV):

Establishing scalable, transparent methods to monitor local climate policy performance and incorporate them into national and international MRV frameworks. How It Operates: Make use of data gathering procedures and established indicators. Connect national inventory to local monitoring systems. Assist local governments in updating national authorities on their progress. For instance, subnational emissions data from businesses and municipalities are included in Mexico's National Emissions Registry. Green infrastructure is planned using **Geographic Information Systems (GIS).** Data from remote sensing to track coastal erosion or deforestation. Systems for submitting emissions inventories online to national databases. Forecasting and Decision-Support Systems Climate modeling, early warning systems, and decision-support software are examples of advanced tools that assist municipal planners in evaluating hazards, setting priorities, and effectively allocating resources.

Coherence of Policy and Integration of Law:

Including climate goals in current local development plans, legislation, and policies. How It Operates: Laws pertaining to energy, agriculture, urban planning, and disaster management should all take climate change into account. Ensure policy uniformity across ministries and government levels. For instance, local climate change action plans must be incorporated into land-use and development plans in the Philippines.

Inclusive and Participatory Policymaking:

Including local stakeholders in the formulation and implementation of climate policies, such as communities, corporations, and indigenous organizations. How It Operates: Hold workshops for participatory planning and local consultations. Adaptation strategies should incorporate traditional knowledge. Give fair access to resources and decision-making top priority. For instance, national climate resilience plans in Kenya have incorporated community-driven adaptation initiatives in arid areas. Vulnerable Communities, Indigenous Groups, and Civil Society Local ownership and legitimacy are increased through inclusive governance. Input from those most impacted by climate change should be gathered through participatory procedures such as town halls, consultations, and public hearings. For instance, efforts for water conservation or sustainable land management can be informed by indigenous knowledge. Collaborating to Develop Locally Specific Solutions Co-designing policies with local stakeholders increases their effectiveness. Policymakers should collaborate to identify issues, establish priorities, and create solutions that take into account the local environment, economy, and culture.

Recommendation for improved alignment:

At international levels- Strengthening transparency and accountability will enhance credibility and implementation which can be done by expanding the Global Stocktake process to include localized assessments of progress. Developing peer review mechanisms that allow countries to evaluate each other's performance and provide constructive feedback.

Vulnerable countries and communities often bear the brunt of climate impacts despite contributing the least to emissions. By ensuring that the COP27-established Loss and Damage Fund is fully operationalized and has application procedures that are easily accessible to local actors. Boost financing and technical support for community-based adaptation, early warning systems, and climate-resilient infrastructure. Promote risk-pooling and insurance strategies for the effects of extreme weather.

At National levels: National governments play a critical role in empowering subnational actors through supportive policies and legislation. Implementing legislation requiring local planning and budgeting to incorporate climate factors. Providing national standards for LCAPs (local climate action plans) that complement NDCs, Giving local climate efforts specific budget lines or financial incentives.

Effective climate governance requires seamless communication and cooperation between levels of government. Establishing Intergovernmental councils, digital platforms, committees will be helpful for better implementation of programs.

At local levels : Creating public-private partnerships (PPPs) to expand resilient infrastructure, green transportation, and renewable energy., Involving NGOs and civil society groups in participatory planning, education, and outreach, Providing incentives (such as tax breaks or recognition programs) for business sustainability projects that support regional objectives.

For eg., The Indian government introduced the **National Action Plan on Climate Change** (**NAPCC**) in 2008, outlining a thorough plan to combat climate change and advance sustainable development. It consists of eight main missions that focus on important topics like energy efficiency, sustainable agriculture, solar energy, water conservation, and forest cover. By emphasizing mitigation and adaptation through the use of technology, legislative changes, and public awareness, the strategy seeks to strike a balance between environmental preservation and economic growth.

Conclusion:

Climate change demands that local implementation and global frameworks be effectively harmonized. Local governments and communities are ultimately responsible for bringing these aspirations to reality via concrete measures, even though international agreements such as the Paris Agreement set broad targets and rally support from around the world. It takes multi-level governance, sufficient funding, inclusive policies, and the strategic application of data and technology to close the gap between global vision and local implementation. Research from a variety of settings shows both advancements and enduring obstacles, emphasizing the necessity of more effective institutional coordination and context-appropriate tactics. Climate policies must give equal weight to what must be done on a global scale as well as what may be done locally in a practical and equitable manner. Encouraging local actors while upholding a cohesive, scientifically grounded global commitment is essential to the success of climate action.

EXPLORING THE LANDSCAPE OF CLUSTERING ALGORITHMS: A COMPREHENSIVE REVIEW

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Abstract

Clustering algorithms are a subset of unsupervised machine learning techniques aimed at discovering patterns or structures within data by grouping similar items into clusters. These methods vary depending on the nature of the data and the desired characteristics of the clusters. Clustering is widely used across domains such as data analysis, image processing, pattern recognition, and customer segmentation. It also plays a crucial role in emerging fields like robotics, big data, and artificial intelligence. To enhance the speed, efficiency, and scalability of these algorithms, hardware acceleration through Very Large Scale Integration (VLSI) has become increasingly important. VLSI technology enables the integration of millions of transistors on a single chip, offering substantial performance gains for computation-intensive tasks like clustering. The implementation of clustering algorithms in VLSI provides real-time, scalable, and energy-efficient solutions, bridging the gap between algorithmic innovation and hardware capability. This paper presents a comprehensive review of the hardware implementation of clustering algorithms.

Keywords: Clustering, Clustering algorithms, Machine learning, VLSI implementation, Speed, Efficiency, Scalability.

1. Introduction

A significant amount of data has been gathered and saved in databases as a result of the growing accessibility of computer hardware and software as well as the quick computerization of business. Data analysis was often done by hand in the majority of regions. When human capabilities are no longer sufficient for handling the volume of data processing and investigation, people turn to computing technology to automate the process.

People and organizations deal with a lot of information on a daily basis. Sorting the data into a number of groups, divisions, or clusters is an essential method of handling it. Classifying or organizing this data into a number of categories or clusters is one of the most important methods for handling them. As one of the oldest human endeavors [7], categorization is, in fact, a crucial and essential part of the lengthy history of human evolution. People constantly strive to find the traits that can explain a new thing or phenomenon before comparing it to other known objects or phenomena. This comparison is based on the similarity or dissimilarity, which is often referred to as proximity, in accordance with specific standards or norms. "According to whether they allocate fresh inputs to one of a finite number of discrete supervised classes or unsupervised categories, classification systems are essentially classified as supervised or unsupervised [8,9].

In machine learning and data analysis, clustering is a basic activity that entails putting related data points together based on particularattributes. The goal of clustering algorithms is to find underlying patterns in a dataset such that natural groups or clusters may be identified. These algorithms are essential in many domains, including image analysis, data mining, pattern recognition, and consumer segmentation.

2. Classification of Clustering Algorithms

Algorithms for clustering can be broadly divided into two categories: partition clustering algorithms and hierarchical clustering algorithms [17]. A hierarchical clustering technique can be further subdivided into agglomerative and divisive approaches. The partitional category has three subcategories: the mixing approach, the fuzzy method, and the hard or crisp clustering method.

2.1 Hierarchical Clustering Algorithms

Data items will be separated into parts using hierarchical clustering methods, a sort of clustering technique [17]. Clusters are built repeatedly, either top-down or bottom-up, to produce a dendrogram that illustrates the defined cluster's hierarchical structure [15]. Data exploration at different granularity levels is made possible by this clustering approach [15]. There are two types of methods: the divisive technique, which uses a top-down strategy, and the agglomerative method, which uses a bottom-up approach. The process agglomerative approach builds the hierarchy's different levels by appropriately merging identical elements into larger clusters on several occasions. Until the entire object is changed into a specific cluster or the halting requirements are satisfied, this procedure keeps going. When employing a polarising tactic, the reverse is true.

The cluster that consists of all the items is distributed iteratively until either all the objects form their own cluster or the stopping criterion is met. The degree of similarity or dissimilarity between the cluster elements is used to decide whether to combine or divide the data.

Hierarchical clustering enables the joining or dividing of subsets of a point; the distance between the points of subgroups is computed from the distance of individual points. This is determined using the proximity-based linkage metric. There are three different types of links: full links, which are often utilised in hierarchical clustering, average connections, and single links [16]. The hierarchical clustering approach makes use of n*n linkage metrics, which are generated as connection matrices for the clustering. Creating the similarity matrix requires identifying the similarities between every pair of data items. It is standard practice to estimate the pair wise distance between each cluster when choosing a connecting criteria. We are able to calculate the distance between the cluster groups by using the similarity measure. It is also applied to the problem of explaining how the clusters arise.

2.2 Partitional Clustering Algorithm

There is no hierarchical structure; instead, data is organized using a partitional clustering technique into nested groupings [18]. The partitioning approach may be used to solve clustering difficulties in applications that need large data sets and for which it would be computationally expensive to create a dendrogram [19]. To replicate the organic groups that are already present in the dataset, they operate by forming data clusters. The dataset of n items is iteratively divided into a predetermined k number of unique subsets by the optimization of a criteria function [21]. A new approach called k-SCC is to get the best possible value for k when clustering categorical data [22]. The squared error criteria are the most commonly used criteria functions in partitional clustering algorithms. The primary objective is to identify the segment that **iv. Repeating Steps ii and iii:** Iterate steps 2 and 3 until convergence is reached or a stopping criterion is met. The process iterates for a fixed number of times, or until points in each cluster stop moving across to different clusters. This is called convergence.

The k-means algorithm aims to minimize the sum of squared distances between data points and their respective cluster centroids. This objective function is also known as the "inertia" or "within- cluster sum of squares."

The Euclidean metric is taken into consideration since it is a commonly used and simple to implement distance metric that is integrated with K-means clustering. It also yields the best solution [28, 29]. The following gives the Euclidean distance, minimizes the square error for a given quantity of clusters. Problems in the patterns' deviations from the cluster centers are $(P, C) = \sqrt{}\Sigma|P - C|^2$I (1) depicted by the error when the patterns are seen as a group of k-numbered spherical shape clusters. A novel way was discovered to extend the k-means approach for clustering categorical data by utilizing an information theoretic dissimilarity measure and a kernel-based strategy for representation of cluster means for categorical items.

The partitional clustering procedure, which distributes the data items in clusters repeatedly in order to minimize the square error, is based on the initial dataset partition. A set of K widely separated seed points can be randomly selected from the pattern matrix to establish the first division. The square error tends to decrease as the number of clusters rises, and thus minimizing is only possible for aWhere P is the data point, C is the cluster center, and n is the number of features. However, because of the multiplication operation required to get the square operation, the Euclidean distance consumes a significant amount of processing resources when implemented in hardware; thus decreases the amount of parallelism that may be used since repeated distance calculations are required. This is particularly valid when utilizing a lot of clusters. As a result, earlier teams working on the hardware implementation of K-means clustering for image segmentation have employed the Manhattan distance, which is an alternative distance metric that is depicted in (2) below: n given number of clusters. $D(P, C) = \sqrt{}\Sigma|P - C|(2)$

The square error criteria function is used in a variety of partition clustering algorithms to produce K-numbered clusters that are distinct and compact. Compared to other criterion functions, it is more energy-efficient [20]. Various divisions may result in different clusters since square-error-based approaches tend to the local optimum solution, especially if the initial points are not far apart [18]. Partitional clustering may be further classified into three basic categories: mixture resolving, hard/crisp clustering, and fuzzy clustering.

3. K-MEANS CLUSTERING

The most popular clustering technique, K-means clustering algorithm is an unsupervised data mining technique and has been used to solve the problem in real life. The K-Means clustering is utilized in a variety of fields, including pattern recognition, computer vision, and information retrieval. In order to group together comparable data points, K-means clustering divides n data points into k clusters. Using an iterative process, each point is assigned to the cluster whose centroid is closest. The centroid of these groupings is then determined once more by averaging them. The k-means algorithm is a popular unsupervised machine learning clustering algorithm used for partitioning a dataset into K distinct, non-overlapping subsets (clusters). It aims to group data points that are similar to each other and separate those that are dissimilar. Here's an overview of how the k-means algorithm works:

i. **Initialization:** Choose the number of clusters (K) that you want to form. Randomly initialize K cluster centroids. These centroids represent the center points of the initial clusters.

ii. **Assigning Data Points to Clusters:** For each data point, calculate its distance to each centroid. Assign the data point to the cluster whose centroid is the closest (usually based on Euclidean distance).

iii. **Updating Cluster Centroids:** Recalculate the centroids of the clusters based on the mean of all the data points assigned to each cluster. Where P is the data point, C is the cluster center, and n is the number of features. Their findings demonstrated that it outperformed the Euclidean metric in terms of speed since it does not necessitate computing the square, allowing for greater parallelism exploitation and double the speed gained by Euclidean distance [30]. The precision of this distance measure was discovered to be somewhat less accurate than the Euclidean metric [28], although the findings were still within an acceptable error. The size of the set and the number of clusters chosen will determine how long it takes to finish the clustering process for a whole dataset; the larger the clusters, the longer it will take to compute the distances.

The K-means algorithm creates hyper spherical clusters, but when the clusters themselves assume different geometric forms, it breaks down horribly. Consequently, it is not possible to apply the K-means technique; instead, alternative clustering algorithms need to be considered [3].

4. Hardware Implementation

Some hardware designs provide parallel processing capabilities that can be used to speed up and improve the effectiveness of clustering operations. Hardware implementations of clustering algorithms can take the following forms:

4.1 Graphics Processing Units (GPUs):

Since many clustering techniques are parallelizable, GPUs are ideally suited for parallel processing. Faster convergence can be achieved by using GPUs to execute algorithms such as K-Means, which can calculate many data points simultaneously.

4.2 Field-Programmable Gate Arrays (FPGAs):

FPGAs provide designers more freedom when creating unique hardware solutions for certain clustering algorithms. Customised hardware designs may be made to take use of the parallelism present in FPGA architectures to speed up the calculations required for clustering.

4.3 Application-Specific Integrated Circuits (ASICs):

ASICs are specialized hardware with great performance and power efficiency that are created for certain uses. Creating ASICs with clustering algorithms in mind might result in specialized hardware acceleration, but it costs a lot of money and knowledge.

4.4 Neuromorphic Processors:

The architecture and operation of neuromorphic computers are intended to resemble those of the human brain. They might be useful for putting biologically inspired clustering algorithms—like self- organizing maps—into practice.

4.5 Parallel Computing Clusters:

Algorithms for clustering can be distributed and parallelized among a group of linked computers. Distributed computing capabilities are made possible by technologies like Apache Spark, which enable the concurrent execution of clustering algorithms over several nodes.

4.6 Tensor Processing Units (TPUs):

Google's TPUs are designed with machine learning tasks, such as clustering, in mind. Their emphasis on tensor operations makes them especially useful for deep learning-based clustering methods.

4.7 Quantum Computing:

As quantum computing technology advances, it could provide new avenues for more effective clustering job execution in the future. Some clustering issues could be sped up by using quantum methods. It's important to remember that the particular clustering technique, the dataset's properties, and the hardware resources available all affect how the hardware is implemented. The decision about CPU, GPU, FPGA, ASIC, or other specialized hardware is based on a number of variables, including algorithmic parallelism, cost, and scalability. Furthermore, the implementation process can be made simpler by software frameworks and libraries that provide hardware acceleration, such CUDA for GPUs.

There are numerous applications for the K-Means algorithm, which is implemented in field programmable gate arrays (FPGAs). Hardware description language (HDL) or schematic entries can also be used by the hardware platform design entries to reconfigure it [24]. Grouping items that are related to each other yet distinct from other object groups is the goal of this clustering. Each point is therefore allocated to the cluster with the closest centroid in the K- Means clustering technique, which has a centroid, or centre point, of the cluster. It is necessary to define and specify the number of clusters. The power of combining a graphics processing unit (GPU) with symmetric multiprocessing (SMP) is greater than that of combining SMP with FPGA. However, the FPGA is able to control data motions and decouple accelerator computation and communication, but the GPU is unable to enhance the optimal SMP [25]. The procedure in a heterogeneous big data system might be accelerated by the combination of hardware and software [26]. In a heterogeneous computer cluster, the FPGA-based K-means implementation has demonstrated effective performance and independent data transfer across many FPGAs [27].

5. Challenges in Vlsi Implementation

The integration of hundreds or millions of transistors onto a single chip is known as very-large-scale integration, or VLSI, and it is essential to the creation of contemporary electronic gadgets. Pattern identification, picture analysis, and signal processing are just a few of the areas where clustering algorithms implemented on VLSI circuits might be useful.

Considerations and challenges in VLSI implementation of clustering algorithms are:

5.1 Algorithm Selection:

The choice of clustering algorithm is essential. Some algorithms, like K-Means, are relatively straightforward to implement in hardware due to their iterative nature, while others may be more complex.

5.2 Parallelism and Pipelining:

VLSI chips can take advantage of parallelism to enhance processing speed. Parallelizing certain steps of clustering algorithms or implementing pipelining can lead to more efficient hardware designs.

Data Representation:

Efficient representation of data is crucial. For example, fixed-point arithmetic might be preferred over floating-point arithmetic to save on chip area and power consumption.

5.3 Memory and Storage:

Efficient memory management is crucial for VLSI implementations. On-chip memory can be used to store intermediate results and reduce the need for external memory access, which can be slower and more power-consuming.

5.4 Power Consumption:

Power efficiency is a critical concern in VLSI design. Clustering algorithms implemented in hardware should be designed to minimize power consumption, especially in applications where energy efficiency is paramount.

5.5 Custom Hardware Accelerators:

For specific clustering algorithms that are computationally intensive, custom hardware accelerators can be designed to perform the clustering tasks efficiently. These accelerators can be optimized for the specific requirements of the algorithm.

5.6 Integration with Other Circuits:

VLSI implementations of clustering algorithms may need to be integrated into larger systems or circuits. Compatibility with other components, such as sensors or communication interfaces, should be considered.

5.7 Scalability:

VLSI designs should be scalable to accommodate varying data sizes and complexities. This is particularly important as the demand for processing larger datasets continues to grow.

5.8 Testing and Verification:

Rigorous testing and verification are essential in VLSI design. Hardware implementations of clustering algorithms should be thoroughly tested for correctness and performance.

5.9 Technology Constraints:

VLSI designs are subject to technology constraints such as the fabrication process, transistor size, and available resources. Designers need to optimize the algorithm for these constraints to ensure a feasible hardware implementation.

The implementation of clustering algorithms in VLSI requires a multidisciplinary approach, involving expertise in algorithm design, VLSI architecture, digital design, and signal processing. As technology advances, new opportunities and challenges may arise, and designers will need to adapt their approaches to meet the demands of emerging applications and hardware capabilities.

6. Conclusion and Future Aspects

In many fields, including computer science, data science, statistics, pattern recognition, artificial intelligence, machine learning, and so on, clustering has shown to be useful for data mining and analysis. The most fundamental problem in cluster analysis is figuring out how many clusters there are in advance. Establishing an optimal number of clusters in advance can help solve a lot of clustering problems. For this reason, automatic clustering techniques are starting to become the standard rather than the exception. Automated clustering techniques were created so that clustering may be done without any prior knowledge of the data sets. They are also capable of figuring out how many groups to include in a noisy dataset. This work offers a comprehensive and up-to-date review of traditional and novel clustering methods. This study may provide insights for practitioners as well as researchers.

In addition, future studies should look at the characteristics of different clustering methods and how effectively both maps address issues in other application domains, as well as the particular challenges encountered in those industries. Future studies may also examine the application of more advanced or hybrid clustering algorithms in a certain field, taking into account the many trends this study identified. The data in this study may be used as a basis for experts and researchers to create new, more powerful, and efficient clustering algorithms.

Reference

- Hussain, Hanaa M., et al. "FPGA implementation of k-means algorithm for bioinformatics application: An accelerated approach to clustering microarray data." 2011 NASA/ESA Conference on Adaptive Hardware and Systems (AHS). IEEE, 2011.
- Leeser, Miriam, et al. "Design tradeoffs in a hardware implementation of the k-means clustering algorithm." Proceedings of the 2000 IEEE Sensor Array and Multichannel Signal Processing Workshop. SAM 2000 (Cat. No. 00EX410). IEEE, 2000.
- Cardarilli, Gian Carlo, et al. "A parallel hardware implementation for 2-D hierarchical clustering based on fuzzy logic." IEEE Transactions on Circuits and Systems II: Express Briefs 68.4 (2020): 1428-1432.
- A. Kumar, R. Sinha, V. Bhattacherjee, D. S. Verma, S. Singh, "modeling using K-means clustering algorithm", IEEE 2012, 1st international conference on recent advances in information technology(RAIT).
- Rui Xu and D. Wunsch, "Survey of clustering algorithms," in IEEE Transactions on Neural Networks, vol. 16, no. 3, pp. 645- 678, May 2005, doi: 10.1109/TNN.2005.845141.
- Xu, Dongkuan, and Yingjie Tian. "A comprehensive survey of clustering algorithms." Annals of Data Science 2 (2015): 165-193.
- M. Anderberg, Cluster Analysis for Applications, New York:Academic, 1973.
- C. Bishop, Neural Networks for Pattern Recognition, New York:Oxford Univ. Press, 1995.
- V. Cherkassky and F. Mulier, Learning From Data: Concepts Theory and Methods, New York:Wiley, 1998.
- R. Duda, P. Hart and D. Stork, Pattern Classification, New York:Wiley, 2001.
- Abbas, Osama Abu. "Comparisons between data clustering algorithms." International Arab Journal of Information Technology (IAJIT) 5.3 (2008).
- Nagpal, Arpita, Arnan Jatain, and Deepti Gaur. "Review based on data clustering algorithms." 2013 IEEE conference on information & communication technologies. IEEE, 2013.
- Rasmussen, Edie M. "Clustering algorithms." Information retrieval: data structures & algorithms 419 (1992): 442.
- Bindra, Kamalpreet, and Anuranjan Mishra. "A detailed study of clustering algorithms." 2017 6th international conference on reliability, infocom technologies and optimization (trends and future directions)(ICRITO). IEEE, 2017.
- Pitafi, S.; Anwar, T.; Sharif, Z. A Taxonomy of Machine Learning Clustering Algorithms,

Challenges, and Future Realms. Appl. Sci. 2023, 13, 3529.

- Saxena, A.; Prasad, M.; Gupta, A.; Bharill, N.; Patel, O.P.;
- Tiwari, A.; Er, M.J.; Ding, W.; Lin, C.-T. A review of clustering techniques and developments. Neurocomputing 2017, 267, 664–681. Murtagh, F.; Contreras, P. Algorithms for hierarchical clustering: An overview. Wiley Interdiscip. Rev. Data Min. Knowl. Discov. 2012, 2, 86–97.
- Olson, C.F. Parallel algorithms for hierarchical clustering. Parallel Comput. 1995, 21, 1313–1325.
- Jain, A.K.; Murty, M.N.; Flynn, P.J. Data clustering: A review. ACM Comput. Surv. 1999, 31, 264–323.
- Jain, A.K. Data clustering: 50 years beyond K-means. Pattern Recognit. Lett. 2010, 31, 651–666.
- Kim, J.; Billard, L. A polythetic clustering process and cluster validity indexes for histogram-valued objects. Comput. Stat. Data Anal. 2011, 55, 2250–2262.
- Ahmad, A.; Dey, L. A k-mean clustering algorithm for mixed numeric and categorical data. Data Knowl. Eng. 2007, 63, 503–527.
- Dinh, D.-T.; Fujinami, T.; Huynh, V.-N. Estimating the Optimal Number of Clusters in Categorical Data Clustering By Silhouette Coefficient. In Proceedings of the International Symposium on Knowledge and Systems Sciences, Singapore, 29 December 2019; pp. 1–17.
- Saxena, A.; Prasad, M.; Gupta, A.; Bharill, N.; Patel, O.P.; Tiwari, A.; Er, M.J.; Ding, W.; Lin, C.-T. A review of clustering techniques and developments. Neurocomputing 2017, 267, 664–681.
- Wibowo FW (2011), Interoperability of Reconfiguring System on FPGA Using a Design Entry of Hardware Description Language, Proceedings of the 2011 Computation and Communication Technologies: 3rd International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2011 - Computer Science Series 1, pp. 79- 83.
- Ying HX, Miquel V, Beñat A, Javier D, Carlos A, Daniel JG, Xavier M & Filippo M (2017), Implementation of the K-means algorithm on heterogeneous devices: a use case based on an industrial dataset, Advances in Parallel Computing, pp. 642- 651. International Journal of Engineering & Technology 93
- D. Lee, Alric A, Dustin R & Ryan K (2017), A streaming clustering approach using a heterogeneous system for big data analysis, Proceedings of the 2017 IEEE/ACM International Conference on Computer -Aided Design (ICCAD), pp. 699 - 706
- Yuk MC & Hayden KHS (2014), Map -reduce processing of K means algorithm with FPGA

-accelerated computer cluster, Proceedings of the 2014 IEEE 25th International Conference on Application-Specific Systems, Architectures and Processors, pp. 9-16.

- M. Estlick, M. Leeser, J. Theiler, and J.J. Szymanski, "Algorithmic Transformations in the Implementation of Kmeans Clustering on Reconfigurable Hardware," in International Symposium on Field Programmable Gate Arrays, pp. 103-110, 2001.

- M.D. Estlick, "An FPGA Implementation of the K-means Algorithm for Image Processing", M.S. thesis, Dept. Elect. Eng., Northeastern Univ., Boston, MA., 2002.

- D. Lavenier, "FPGA implementation of the K-means clustering algorithm for hyperspectral images", Los Alamos National Laboratory, LAUR # 00-3079, pp. 1-18, 2000

ANALYSING SUSTAINABLE CONSUMER PURCHASE INTENTIONS AS EFFECTS OF CELEBRITY'S PERSONALITY TRAITS IN INDIA

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Abstract

This study examines the influence of celebrity personality traits on sustainable consumer purchase intentions in the Indian context. With growing environmental awareness, consumers are increasingly drawn to eco-friendly products, and celebrities play a pivotal role in shaping these preferences. The research explores how traits such as trustworthiness, attractiveness, expertise, and credibility impact consumers' willingness to purchase sustainably. Using quantitative methods and data from Indian consumers, the study provides insights into the psychological and cultural dynamics driving sustainable buying behaviours. The findings aim to guide marketers and policymakers in crafting effective, personality-driven endorsements for green products.

Keywords: Sustainable consumption, celebrity endorsement, personality traits, purchase intention, consumer behaviour, India, eco-friendly marketing.

Introduction

Sustainable consumption has emerged as a crucial area of focus in today's global marketplace, particularly in response to the growing environmental crisis, ethical concerns, and socio-economic inequalities. As consumers become more conscious of their environmental impact, sustainable purchase intentions—defined as the deliberate decision to choose products that are environmentally friendly, ethically sourced, or socially responsible—have gained momentum (Joshi & Rahman, 2015). In India, a nation grappling with rapid urbanization and ecological degradation, sustainability is not just a trend but a necessity. The rise of sustainability-conscious consumers, particularly among urban millennials and Gen Z, indicates a significant shift in buying behavior (Gupta & Ogden, 2009). However, while awareness levels may be high, actual purchase behavior often does not align with sustainable intentions—a phenomenon known as the "attitude-behavior gap" (Vermeir & Verbeke, 2006).

Amid this evolving consumer landscape, celebrity endorsements have become an influential marketing strategy for bridging the gap between intention and behavior. Celebrities, by virtue of their popularity and perceived credibility, significantly influence public attitudes and consumption decisions (McCracken, 1989). In India, where celebrities from the film and sports industries command massive followings, their endorsements can amplify brand visibility and impact consumer trust and purchase intent (Choi & Rifon, 2012). Importantly, the effectiveness of such endorsements is not solely based on celebrity status but also on the personality traits of the endorser—such as trustworthiness, attractiveness, expertise, and credibility (Ohanian, 1990).

These traits shape the perceived authenticity of the message and the consumer's emotional connection to the brand, thereby influencing their inclination toward sustainable products.

Recent studies have shown that the alignment of a celebrity's personality with the brand values significantly enhances the consumer's purchase decision, especially in the case of cause-related or green marketing (Roy, 2012; Amos, Holmes, & Strutton, 2008). For instance, a celebrity known for philanthropic work or environmental advocacy is more likely to positively influence sustainable purchase intentions compared to one associated solely with entertainment. Furthermore, the cultural context of India—with its unique blend of collectivist values, social influence, and reverence for authority figures—amplifies the impact of celebrity endorsements on consumer behavior (Hofstede, 2001; Biswas, Hussain, & Oommen, 2020). Thus, understanding the specific personality traits that resonate with Indian consumers becomes critical in crafting effective sustainability-driven marketing strategies.

Despite the potential of celebrity endorsements in promoting sustainable consumption, limited empirical research has explored this intersection in the Indian context. Most existing studies have either focused on general consumer behavior or celebrity endorsement in non-sustainable categories (Kahle & Homer, 1985; Erdogan, 1999). Therefore, this study aims to fill this gap by analyzing how various celebrity personality traits influence sustainable consumer purchase intentions in India. By identifying which traits have the most significant impact, the research offers valuable insights for marketers, brand managers, and policymakers aiming to drive behavioral change through celebrity advocacy.

Literature Review

Sustainable consumption in India has gained prominence due to increasing environmental awareness and the adverse effects of rapid industrialization. Joshi and Rahman (2015) highlighted that Indian consumers are becoming more conscious of their ecological footprints, leading to a rise in demand for eco-friendly products. However, despite this awareness, a significant gap exists between consumers' attitudes toward sustainability and their actual purchasing behaviors, often referred to as the "attitude-behavior gap" (Vermeir & Verbeke, 2006). This discrepancy underscores the need to explore factors that can bridge this gap and influence sustainable purchase intentions.

Celebrity endorsements have long been utilized as a strategic tool in marketing to influence consumer perceptions and behaviors. McCracken (1989) introduced the concept of the "meaning transfer model," suggesting that celebrities transfer their symbolic meanings to products, thereby enhancing their appeal. In the Indian context, celebrities from the film and sports industries wield significant influence over public attitudes and consumption decisions (Choi & Rifon, 2012). Their endorsements can enhance brand visibility and credibility, making them powerful agents in shaping consumer behavior.

The effectiveness of celebrity endorsements is not solely dependent on the celebrity's fame but also on their personality traits. Ohanian (1990) identified three key dimensions—attractiveness, trustworthiness, and expertise—that determine the effectiveness of a celebrity endorser. These traits influence how consumers perceive the endorsed brand, affecting their attitudes and purchase intentions. In India, where cultural values and social norms play a significant role, the alignment of a celebrity's personality with the brand's values can enhance the endorsement's effectiveness (Hofstede, 2001).

The halo effect, a cognitive bias where the perception of one positive trait influences the perception of other unrelated traits, plays a crucial role in celebrity endorsements. According to Celewish (2023), Indian consumers often associate the positive attributes of a celebrity, such as trustworthiness and attractiveness, with the products they endorse. This effect can enhance the perceived value of sustainable products endorsed by celebrities, thereby influencing purchase intentions.

The congruence between consumer and celebrity personality traits can significantly impact the effectiveness of an endorsement. Hussain et al. (2024) found that dimensions such as conscientiousness, extroversion, and openness in consumers were positively related to similar traits in celebrities, leading to favorable attitudes and increased purchase intentions. This alignment suggests that marketers should consider the personality traits of both the celebrity and the target audience when planning endorsements.

The rise of social media has introduced a new class of celebrities—social media influencers—who play a pivotal role in shaping consumer behavior. Meena (2023) discussed how influencers, through their relatable content and personal engagement, influence their followers' purchasing decisions. In the realm of sustainable consumption, influencers who advocate for eco-friendly products can effectively promote sustainable behaviors among their followers, especially among younger demographics.

India's collectivist culture and reverence for authority figures enhance the impact of celebrity endorsements. Biswas et al. (2020) noted that Indian consumers are more likely to be influenced by celebrities who embody cultural values and social norms. Therefore, celebrities who promote sustainability in ways that resonate with Indian cultural values can effectively encourage sustainable consumption patterns.

Several Indian celebrities have actively promoted sustainability, serving as role models for their followers. Bhumi Pednekar, for instance, was appointed as India's first National Advocate for Sustainable Development Goals by the United Nations Development Programme, highlighting her commitment to environmental causes (Bhumi Pednekar, 2023). Similarly, Priyanka Chopra Jonas launched Anomaly, a sustainable hair care line, emphasizing affordability and eco-consciousness (Chopra Jonas, 2021). These initiatives demonstrate how celebrities can influence sustainable consumer behaviors through their endorsements and personal commitments.

Research indicates that celebrity endorsements can significantly affect consumer purchase intentions, especially when the celebrity's personality traits align with the brand's values. A study by Dey et al. (2024) found that young consumers were more likely to purchase cosmetic products endorsed by celebrities perceived as trustworthy and expert. This finding underscores the importance of selecting the right celebrity to promote sustainable products.

Understanding the interplay between celebrity personality traits and sustainable consumer purchase intentions can provide valuable insights for marketers and policymakers. By aligning celebrity endorsements with the values and preferences of the target audience, brands can enhance the effectiveness of their marketing strategies. Additionally, promoting celebrities who actively engage in sustainability initiatives can inspire consumers to adopt more sustainable consumption behaviors.

3.1 Questionnaire Development

A self-administered questionnaire was developed for the study. The questionnaire includes items which measures different constructs used in our study (Attractiveness, Trustworthiness, Expertise and Purchase Intention). Attractiveness is described as an endorser's ability to draw in customers by drawing their attention and being noticed. Five items assessing attractiveness were selected from the literature (Amos et al., 2015; Ohanian, 1990). A 5-point Likert scale was used to rate each item, with 1 denoting strongly disagree, 3 neutral, and 5 strongly agree.

Trustworthiness is defined as the extent to which endorsers are regarded as sincere, truthful, and honest by the audience. Five trustworthy items were selected from earlier research (Sari et al., 2021; Munnukka et al., 2016). A 5-point Likert scale was used to score the items, with 1 denoting strongly disagree, 3 neutral, and 5 strongly agree.

Expertise is defined as the degree to which a communicator is regarded as a reliable source of claims. Expertise is measured through a five items scale which has been adapted from previous literature for our study (Lee et al., 2021; Wang and Scheinabaum, 2017). A 5-point Likert-type scale was used to measure the level of agreement of respondents, with 1 denoting never, 3 neutral, and 5 denoting a lot of agreement.

Purchase Intention is defined as the desire of the customer to buy a particular brand or item. To assess customers' Purchase intentions, three items were chosen from past studies (Tantawi and Sadek, 2019; Belch and Belch, 2018). The items were scored on a 5-point Likert scale, where 1 meant strongly disagree, 3 meant neutral, and 5 meant strongly agree.

The last part of the questionnaire includes items referring to the respondents' demographic information. After the questionnaire was created, it was first pilot tested by three experts who had studied consumers' purchasing habits in retail settings. The questionnaire was pilot tested with 30 respondents once more after it had been reviewed to ensure that it was appropriate, easy to understand, and simple to respond to. After considering the pilot test results, a final questionnaire was created.

3.2 Data collection

A convenience sampling technique was used due to the challenges in obtaining a sampling frame. The researchers distributed the questionnaire electronically through Google forums. To expand the questionnaire's reach throughout the Delhi NCT, respondents were contacted via Facebook and WhatsApp direct messages containing the survey link. The link was also shared in Facebook groups to target respondents who are eighteen years of age or older.

Out of the 700 people who checked the survey, 400 completed it, resulting in a 57.14% response rate. There are 40% female and 60% male participants in the sample. Of those surveyed, 26% were between the ages of 18 and less than 25, 23% were between the ages of 25 and less than 35, 23% were between the ages of 35 and less than 45, 18% were between the ages of 45 and less than 55, and 9% were over 55.

3.3 Data Analysis

Descriptive analyses were performed using the Statistical Package for Social Sciences (SPSS-27.0) to provide general characteristics of the respondents and measurement items. The Cronbach's α test and confirmatory factor analysis was utilized to assess internal consistency and construct validity among the items utilized. AMOS 21 program was utilized to conduct structural equation modeling (SEM) in order to test the research hypotheses.

4. Findings

4.1. Sample

Table 1 shows the demographic details of the sample respondents who participated in the study. The percentage of male and female respondents in our study is almost equal. The majority of respondents are in the 24–45 age range (Table I). Thirty of the 400 respondents surveyed were not included in the study because of the incomplete responses. Our study's response rate is higher than the 80 percent criterion, which clearly illustrates the minimal likelihood of non-response bias (Lai and Chong, 2020).

Location	No. of Respondents	Percentage
North Delhi	86	21%
South Delhi	70	17%
East Delhi	58	14%
West Delhi	64	16%
Gurugram	39	9%
Noida	46	11%
Faridabad	37	9%
Total	400	
Gender	**No. of Respondents**	**Percentage**
Male	240	60%
Female	160	40%
Total	400	
Age	**No. of Respondents**	**Percentage**
less than 25 years	104	26%
25-34 years	92	23%
35-44 years	91	23%
45-54 years	73	18%
55 years & above	40	9%
Total	400	

Educational Qualification		
Primary	25	6%
Matriculation	86	22%
Higher Secondary	68	17%
Graduate	83	21%
Post Graduate	82	21%
Professional Degree	56	14%

Table I

As illustrated in table 1, the sample is nearly evenly divided between males (51%) and females (49%). Most of the responders included in our study (44%) are between the ages of 18 and 24. Respondents from other age groups have also been considered.

4.2. Reliability and Validity of the measures

The Kaiser-Meyer-Olkin (KMO) test yielded a value of 0.895, falling within the permissible range. The high KMO value signifies sample adequacy for our study ($n = 370$). At $p < 0.001$, the Bartlett test of sphericity result was significant.

The distribution of the respondents data was presumed to be normal as both the skewness and kurtosis values were less than the threshold value of 2.0 (Hair et al., 2018). The factor loadings of all the items were greater than the cut off value 0.70. All the items have high factor loadings (0.71 to 0.89) which were statistically significant ($p<0.01$). The descriptive statistics along with composite reliabilities, Average Variance Extracted (AVE) and correlations are shown in table II.

Name	Missing	Mean	Standard Deviation	Kurtosis	Skewness
ATT	0	3.505	1.612	-0.812	0.079
CLASS	0	3.4	1.523	-0.901	0.104
HAND	0	3.640	1.435	-0.909	0.082
ELEG	0	3.551	1.334	-0.912	-0.074
SEXY	0	3.734	1.113	-0.902	0.083
DEP	0	3.856	1.432	-0.949	-0.082
HON	0	3.758	1.145	-0.802	-0.02

RELB	0	3.554	1.3	-0.794	-0.013
SINCR	0	3.635	1.124	-0.899	0.005
TRST	0	3.402	1.56	-0.942	-0.041
EXP	0	3.546	1.549	-0.837	0.054
EXPRT	0	3.238	1.213	-0.764	0.12
KNOW	0	3.664	1.482	-0.907	0.146
QUAL	0	3.635	1.004	-0.729	0.098
SKILL	0	3.7	1.213	-0.737	0.048
PUR	0	3.758	1.626	-0.899	0.005
RECOM	0	3.806	1.65	-0.942	-0.041
OPINION	0	3.847	1.659	-0.837	0.054

Table II

The measures' had discriminant validity as AVE values were greater than 0.50 and the square roots of AVE were greater than the interconstruct correlation (Fornell & Larcker, 1981). Cronbach alpha (CA) values were between 0.87 and 0.94 which were greater than the 0.70 threshold value. Each item's contribution to the total correlation was greater than the suggested level of 0.40 and thus reliability was achieved (Hair et al., 2018).

We also tested common method variance by performing Harman’s one-factor method using Exploratory (EFA) and Confirmatory Factor Analysis (CFA). Factor analysis shows that the largest factor has only 22% of the variance. Thus one single factor does not show foe significant variation in the data. Thus presence of common method bias in the data is rejected (Table III).

	CR	**AVE**	**1**	**2**	**3**	**4**
Expertise	0.88	0.72	**0.84**			
Trustworthiness	0.93	0.73	0.49*	**0.85**		
Attractiveness	0.97	0.92	0.50*	0.61*	**0.95**	
Purchase Intention	0.72	0.88	0.41*	0.64*	0.77*	**0.93**

* p<0.01. The diagonal values are square root of AVE of each construct

Goodness of fit indices ()			
Test Statistics	**Critical value**	**Interpretation**	**Structural Model**
Chi-squared Tests			1.807
1. Normed chi-squared test	Chi-squared/df ≤2	Good fit to the just-identified model.	
Test Statistics Using Covariance Matrix		Assessing the proportion of the variability in the sample covariance matrix explained by the model; GFI> 0.9 suggests a good fit	
1. Goodness of fit index (GFI)	0.9 < GFI < 1		0.939
2. Adjusted goodness of fit index (AGFI)	0.9 < AGFI < 1	Good fit to the just-identified model.	0.987
Comparisons with Independence Models		Not parsimony adjusted; normed; NFI > 0.9 suggests a good fit	
1. Normed fit index (NFI)	0.9 < NFI < 1		0.95
2. Comparative fit index (CFI)	0.9 < CFI < 1	Assuming non-central chi square distribution; assessing the improvement of the hypothesized model relative to the independence model.	0.958

		About 0.90 or higher suggests a good fit	
Root mean square error of approximation (RMSEA)	0 < RMSEA < .08	Good model fit.	0.049

The hypotheses of the study were analysed using three different celebrities. The effect of Expertise, Trustworthiness and Attractiveness on Purchase intention was analysed for three different studies. In study 1, it is found that all the three research hypothesis (H1-H3) are supported. Attractiveness, Trustworthiness and Expertise was found to have a positive impact on Purchase l Intention (Table VII). Attractiveness, Trustworthiness and Expertise explained 64% of the total variance in Purchase Intention (R2 = 0.64). In study 2, H1 is not supported while H2 and H3 are supported. As hypothesized, consumers tend to be influenced more by Trustworthiness and Expertise when celebrity is a sports person (Table VIII). Attractiveness, Trustworthiness and Expertise explained 60% of the total variance in Purchase Intention (R2 = 0.60). In study 3, it is found that all the three research hypothesis (H1-H3) are supported. Attractiveness, Trustworthiness and Expertise was found to have a positive impact on Purchase Intention (Table IX). Attractiveness, Trustworthiness and Expertise explained 70% of the total variance in Purchase Intention (R2 = 0.70).

Conclusion:

The study highlights the significant influence of celebrity personality traits on sustainable consumer purchase intentions in the Indian context. As sustainability becomes an increasingly important consideration in consumer behavior, leveraging the appeal and perceived credibility of celebrities can serve as an effective strategy for promoting eco-friendly products. Traits such as trustworthiness, expertise, attractiveness, and social responsibility emerged as key drivers in shaping consumer attitudes and behaviors. In India, where celebrities hold considerable cultural sway, the alignment of celebrity image with sustainable values can enhance the authenticity of green marketing campaigns and bridge the attitude-behavior gap. The findings emphasize the need for brands to adopt a more strategic and value-driven approach to celebrity endorsements, particularly in the domain of sustainable consumption.

Limitations of Study:

Despite offering meaningful insights, this study is subject to several limitations. First, the research is context-specific and focused on Indian consumers, which may limit the generalizability of the findings to other cultural settings. Second, the reliance on self-reported data introduces the possibility of social desirability bias, particularly in the context of sustainability, where respondents may overstate their green intentions. Third, the study may not fully capture the diversity of celebrity types (e.g., film stars, athletes, influencers) or the nuances of how various product categories (e.g., cosmetics vs. technology) interact with consumer perceptions. Lastly, the influence of other psychological and socio-economic variables such as income, education level, and environmental values were not deeply explored.

Future Scope of Study:

Future research could expand the scope of this study by conducting cross-cultural analyses to understand how celebrity endorsements for sustainable products are perceived in different countries and cultures. Additionally, incorporating longitudinal data could help assess whether celebrity-driven campaigns lead to sustained changes in consumer behavior over time. Researchers could also explore the effectiveness of different categories of celebrities (e.g., micro-influencers, eco-activists) in promoting sustainable consumption across product types. Moreover, integrating advanced psychometric tools or experimental designs could yield deeper insights into the psychological mechanisms driving consumer responses to celebrity personality traits. Finally, further exploration into how digital platforms and social media shape the influence of celebrity endorsements in sustainability marketing would be valuable given the rapid shift toward online engagement.

References:

- Bhumi Pednekar. (2023). Wikipedia. Retrieved from https://en.wikipedia.org/wiki/Bhumi_Pednekar

- Celewish. (2023). The Psychology Behind Celebrity Endorsement & Consumer Behavior. Retrieved from https://www.celewish.com/blog/psychology-behind-celebrity-endorsement

- Chopra Jonas, P. (2021). Of Course Priyanka Chopra Jonas Sings Celine Dion in the Shower. Vanity Fair. Retrieved from https://www.vanityfair.com/style/2021/01/priyanka-chopra-jonas- hair-care-anomaly-interview

- Choi, S. M., & Rifon, N. J. (2012). It's a Match: The Impact of Congruence between Celebrity Image and Consumer's Self-Image on Consumer's Attitudes and Purchase Intentions. Psychology & Marketing, 29(9), 639-650. https://doi.org/10.1002/mar.20508

- Dey, N., Adhikari, K., & Pandiya, D. K. (2024). Influence Of Personality Traits Of Celebrities On Buying Decision Of Cosmetic Products: An Empirical Study. Educational Administration: Theory and Practice, 30(5), 12801–12807. https://doi.org/10.53555/kuey.v30i5.5374

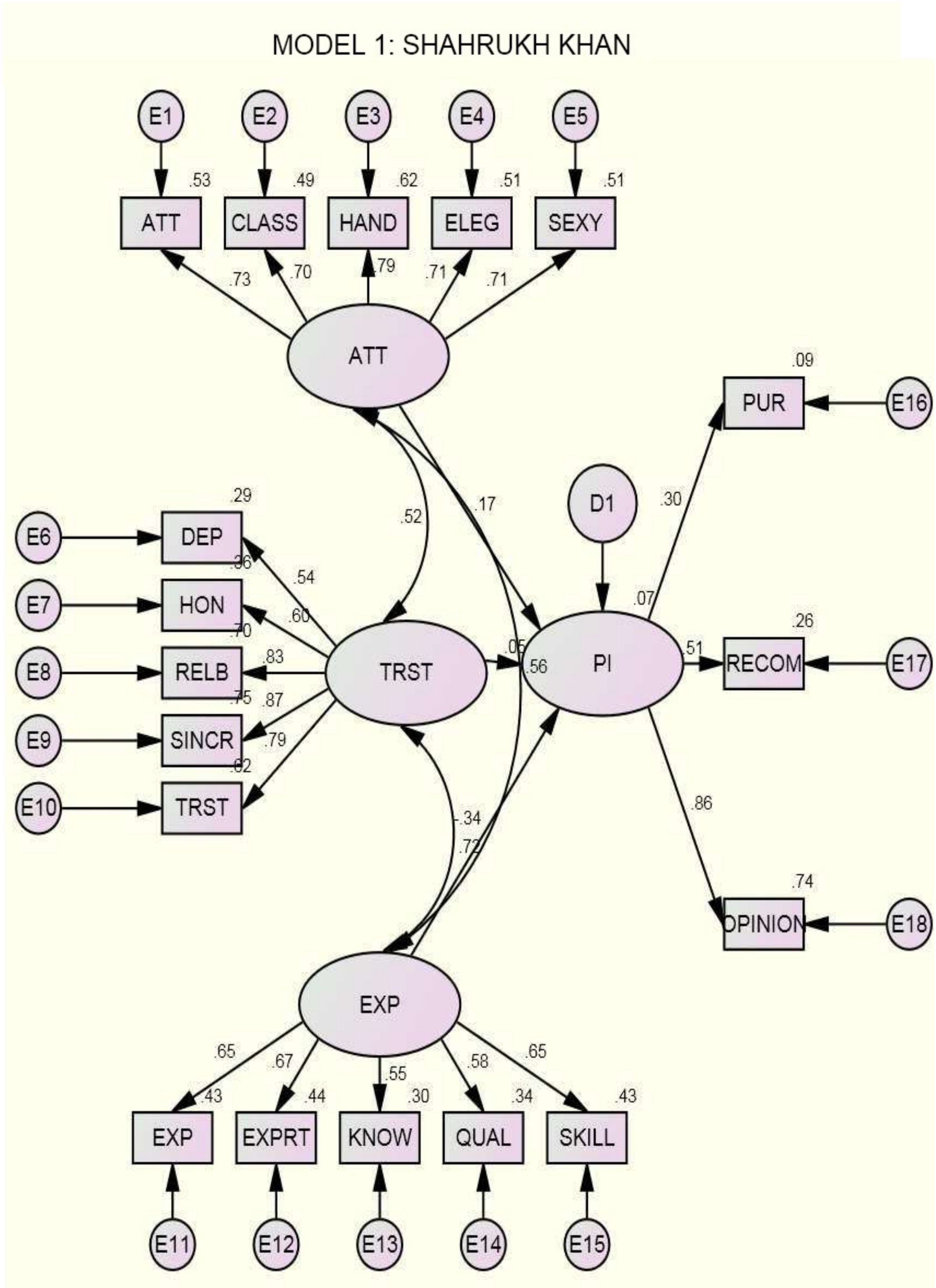

Figure 1: SEM model for Study 1

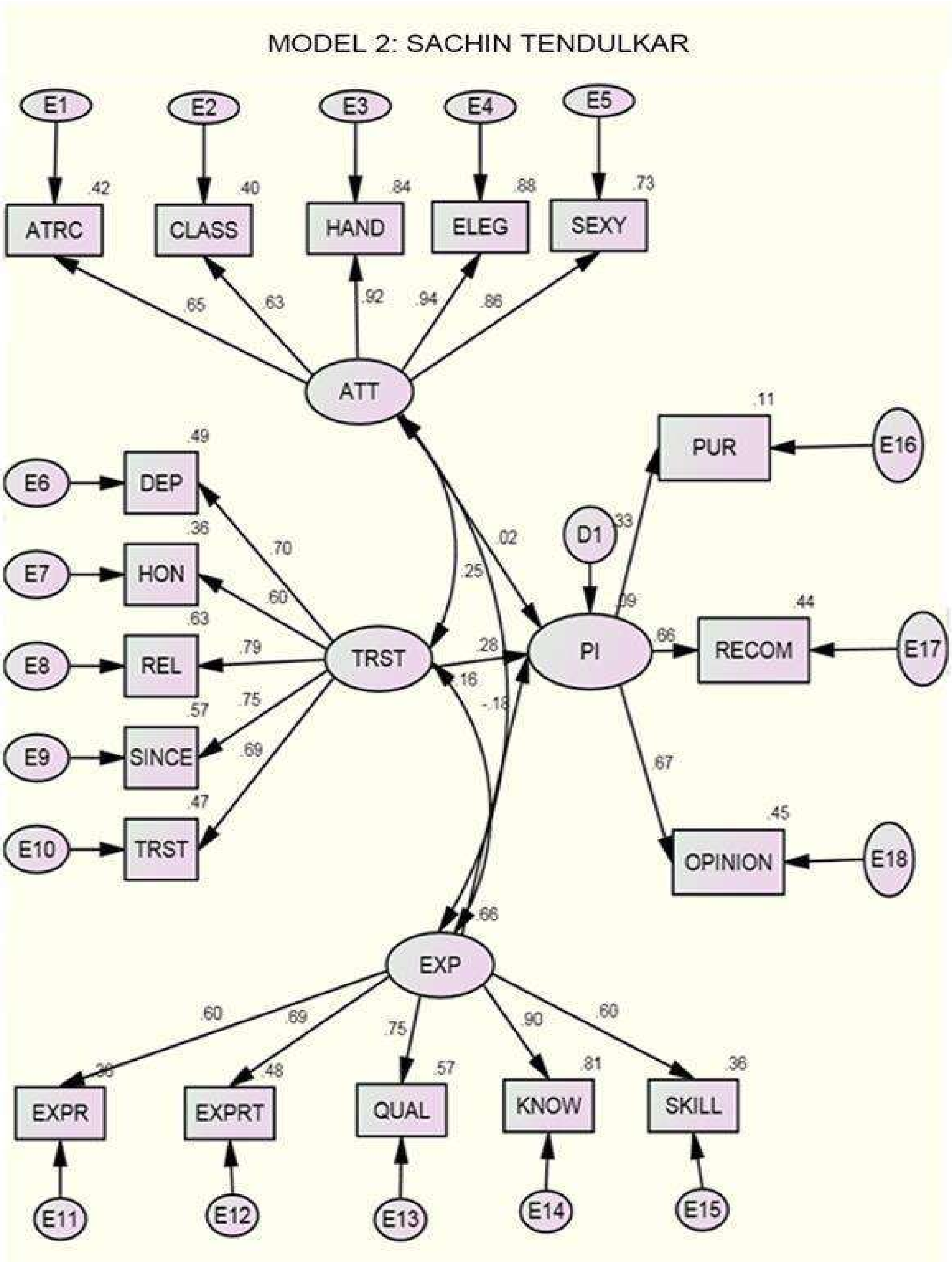

Figure 2: SEM model for Study 2

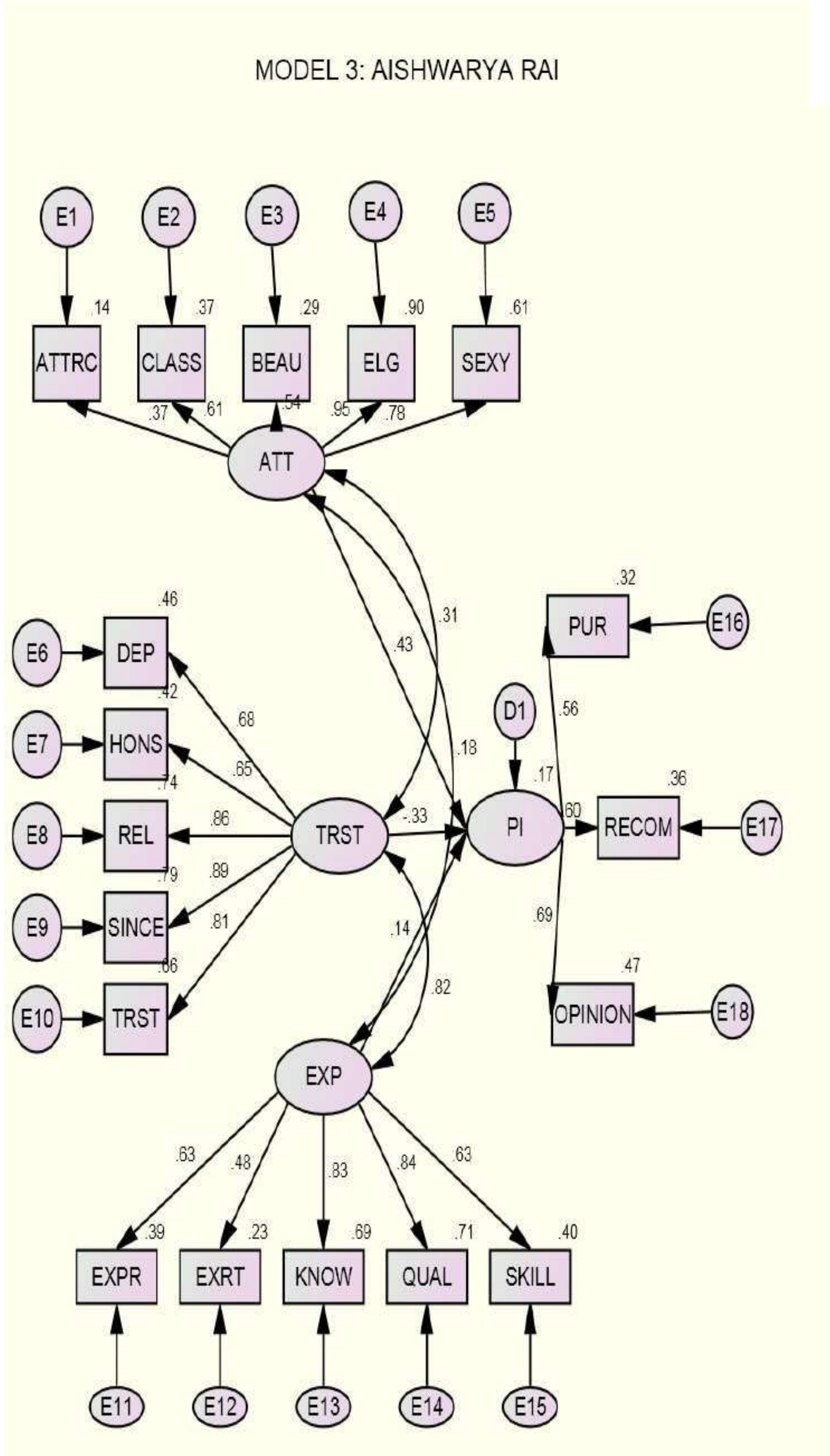

Figure 3: SEM model for Study 3

THE IMPACT OF BUZZ MARKETING ON CONSUMER ENGAGEMENT, BRAND PERCEPTION, AND PURCHASE DECISIONS: A STUDY OF DIGITAL MARKETING STRATEGIES.

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Abstract

Buzz marketing, a dynamic form of word-of-mouth promotion, has emerged as a pivotal strategy in the digital era, leveraging social interactions, influencer endorsements, and viral content to shape consumer perceptions and drive brand engagement. As traditional advertising faces skepticism, businesses increasingly rely on buzz marketing to create organic discussions and excitement. This study explores the effectiveness of buzz marketing in enhancing brand awareness, trust, and purchase intent by analyzing psychological triggers such as exclusivity, curiosity, and social proof. While buzz marketing fosters consumer engagement, it also presents challenges, including misinformation, over-hyped expectations, and ethical concerns. Through case studies of brands like Zomato, Vivo, and Swiggy, this research highlights successful buzz marketing strategies and evaluates their long-term impact on brand loyalty and credibility. The findings emphasize the need for ethical execution and strategic alignment between marketing efforts and consumer expectations to ensure sustained success.

Keywords: Buzz Marketing, Digital Marketing, Influencer Marketing, Viral Content, Word-of-Mouth Marketing, Consumer Engagement, Brand Trust

1. Introduction

Studying consumer behavior is essential for any industry in marketing. Without understanding how consumers think and act, building a strong brand becomes challenging. As the market changes quickly and competition grows, consumer expectations also evolve. To keep up, businesses must adopt new marketing strategies instead of relying only on traditional methods. This is important because people's behavior and preferences are constantly changing. Buzz marketing has become a key strategy in the marketing industry. Buzz marketing is a form of word-of-mouth publicity; it plays an important role for many businesses. Sometimes, people do not trust advertisements but rely on recommendations from others. This is where buzz marketing becomes effective in influencing consumers. Buzz marketing, a subset of word-of-mouth marketing, creates excitement and engagement around a brand, product, or service. It relies on organic conversations and peer recommendations to spread information rapidly. With the rise of social media, consumers have become increasingly influenced by digital buzz, making this marketing strategy more relevant than ever. This paper aims to analyze the role of buzz marketing in shaping consumer behavior and critically assess its effectiveness

1.1 Buzz Marketing:

Buzz marketing is a strategy that aims to generate organic discussions among consumers. Unlike traditional advertising, which relies on direct promotional messages, buzz marketing capitalizes on consumer curiosity, exclusivity, and influencer advocacy.

Johansson (2005); Wells (2004), Many customers prefer to avoid marketing messages that come directly from companies or other sources.

Yessy Artanti, Fajar Hari Prasetyo, and Raya Sulistyowati (2019), in recent years, social media has become an easy way to share information and talk about business activities. It's an effective tool for selling products or services. Social media is also seen as a way to send messages that others will share continuously**.**

Carl, (2006), Buzz marketing is a modern way of promoting products using the internet. It works by getting customers to talk about a product or service and share their opinions. This creates excitement and attracts more people. Since traditional ads are not as effective as before, buzz marketing helps businesses reach more customers and increase demand. Buzz marketing, also called word-of-mouth marketing, happens when people outside the company spread and amplify the original marketing message through their positive or negative opinions.

Mohr, (2007), Buzz uses technology and media to get customers to talk, interact, and share information about a product or brand. The aim is to make the brand interesting, fun, and valuable, creating an engaging marketing experience

Sırma, (2009), For buzz marketing to work; the message must be interesting, creative, fun, or attention-grabbing. This is the key to successfully getting people to talk and share.

Soundararaj et al.,(2015), Buzz marketing is a way of promoting a company, product, or service by encouraging customers, media, and social platforms to talk about it positively. It relies on customer interactions to spread and amplify the original marketing message. Some see buzz as a kind of excitement, anticipation, or a mysterious connection that gets people talking and engaged.

1.2. Key Elements of Buzz Marketing

Influencers and Opinion Leaders: Influencers play a crucial role in creating and spreading buzz. Influencers have power and influence over their followers. Their opinions are noticed more easily and can help raise product awareness and boost sales. Marketers try to get these influencers to create buzz for their products. Some marketers focus on people known as connectors.

Social Media Platforms: Platforms such as Instagram, Twitter, and Facebook serve as catalysts for buzz marketing.

Viral Content: Engaging and shareable content helps spread the marketing message. Viral marketing is about quickly reaching a large number of potential customers by having users share online content, often through social media platforms like Facebook, Instagram, and X.

Brand Advocacy: Loyal customers and brand ambassadors contribute to word-of-mouth promotions. Brand advocacy happens when customers and employees actively promote a brand through word-of-mouth, social media, and other channels. Advocates are usually loyal and happy customers who share their positive experiences, helping to influence potential buyers.

According to (Alwan, 2020) most of the production and marketing organizations have adopted these three key dimensions of buzz marketing like:

Creating Buzz or Marketing hype: In which marketing ads are shared among users through social networks, creating buzz and word-of-mouth promotion for products and services. This approach strongly influences customers and is an effective way to market products and services online.

Seed Planting: The "Product Seed" marketing strategy focuses on identifying influential people in social networks and using their reach to promote a product. By introducing the product to users and encouraging them to choose it over competitors, this approach targets customer already familiar with similar products. Through social networks, ideas about the product are shared to generate buzz and measure interest. Incentives are often given to participants, motivating them to spread the word among friends, family, and other influential users. This highlights the internet's key role in quickly spreading advertisements, leading to widespread exposure within minutes.

Incentives and rewards: Organizations use buzz marketing because it offers various incentives to individuals. By promoting products through social networks like email, Facebook, and Twitter, it reaches friends, family, and influential customers. People involved in these campaigns are motivated by rewards and the opportunity to help others recognize and prefer a brand over its competitors. The internet plays a crucial role in rapidly spreading advertising content, ensuring widespread reach within minutes.

Many marketing organizations rely on buzz marketing as it encourages word-of-mouth promotion and social media engagement. This includes user-generated content like images and videos that influence potential customers. Promotional campaigns are conducted through platforms like email and Facebook to inform and engage people. Those participating in these campaigns are driven by personal rewards and the goal of helping others discover and adopt the brand.

1.3. Consumer Behavior in Response to Buzz Marketing

Consumers are highly influenced by peer recommendations and digital trends. Trust, price sensitivity, and brand perception play crucial roles in their purchasing decisions. Buzz marketing taps into these factors by leveraging familiarity, credibility, and social proof.

Sanjay Hooda,etal (2017) , Says this research examines the relationship between key consumer behavior attributes and their context in E-marketing. Consumers in Jaipur were surveyed to understand how e-marketing influences their purchasing decisions. The results show that internet usage is widespread across all ages and genders. However, there is significant variation in the age groups and characteristics of those engaging in online shopping, though gender does not appear to be a determining factor.

Mirabi et.al, (2015) articulates that, consumer purchasing behavior is a way of understanding why customers choose one brand over others, and it helps predict their buying decisions. Factors like price, quality, and value can affect a customer's intention to buy. Purchase intention is when a customer is likely to buy a product in certain situations. The decision-making process is often complex.

García-Salirrosas et.al, (2022) brings to notice that, customer purchase intention is shaped by factors like the reputation of the company, product quality, and how the product is presented. So, marketing companies should stand out to attract customers.

1.4. Buzz Marketing Strategies:

1. **Influencer Marketing:** Work with influencers who can promote your brand to their large followers, creating excitement through their recommendations.

2. **Branded Hash tags:** Create a unique hash tag for your brand to encourage people to engage on social media and share content related to your campaign.

3. **Buzz Campaigns:** Run campaigns that get people talking and excited about your product, using fun elements like contests, events, or early access.

4. **Monitoring and Engagement:** Keep track of online discussions about your brand, respond to customer feedback, and encourage positive interactions to keep the buzz going.

5. **Online Campaigning:** Use social media to spread your message, connect with potential customers, and encourage sharing.

6. **Know Your Target Audience:** Understand your ideal customer's interests, behaviors, and where they hang out online to tailor your marketing efforts.

7. **Early Adopter Strategy:** Target early users and give them exclusive access to your product, so they spread the word and create buzz.

8. **Align Product Satisfaction with Buzz:** Make sure your product quality and customer experience meet the expectations created by your marketing to keep the buzz positive.

9. **Offline Campaigning:** Use offline tactics like events, public relations, or in-store promotions to create buzz in the real world.

10. **Taboo Marketing:** Sometimes, use slightly controversial or provocative content to spark conversation, but be careful to avoid any negative backlash.

2. Review of Literature:

Keller, (2003) describes that Studying consumer behavior is essential for any industry in marketing. Without understanding how consumers think and act, building a strong brand becomes challenging. As the market changes quickly and competition grows, consumer expectations also evolve. To keep up, businesses must adopt new marketing strategies instead of relying only on traditional methods.

S. Kataria and R. Bhadale, (Dec 2020) analyzed five parameters—brand awareness, brand identification, brand association, perceived quality, and purchase intention in Surat City and found that purchase intention was positively impacted by brand awareness, brand association, and perceived quality, while brand identification showed no significant effect. He states that overall, buzz marketing effectively shapes Gen Z's purchasing decisions through enhanced brand-related perceptions.

Hind Naeem Hoshi, (2023) States that there is a strong and noteworthy relationship between marketing buzz and its dimensions with customer purchase intention in the research sample. Marketing buzz is considered a contemporary marketing tool used to promote products and achieve success and excellence in the speedily developing aspects of life.

P. Vikrant kumar and Dr. Chetan Srivastava, (2022) displays that buzz marketing has become a popular alternative way to communicate with customers because it is seen as more trustworthy. Both millennials and centennials take part in buzz marketing, but in different ways. Millennials often look for others' opinions, while centennials are becoming opinion leaders, creating and sharing content on social media with their friends and family. Millennials are more drawn to buzz about a product's uniqueness, while centennials are more interested in controversial or secret buzz.

Chebli Leila and Gharbi Abderrazak (2013), their studies have shown that buzz marketing campaigns affect factors like brand image, awareness, and purchasing decisions. Buzz marketing is effective because it provides immediate attention, engages the senses, responds directly to consumer needs, and can create meaning, leading to interaction between the consumer and the brand.

Morrisey (2007) , articulates that buzz marketing spreads quickly, like a virus, within a specific group of people who enjoy talking about exciting products or services that leave a lasting impression.

Case Studies of Buzz Marketing in Action

Zomato's Social Media Engagement Zomato uses humorous and relatable content to create buzz around its services. Their Twitter campaigns and meme marketing strategy have successfully engaged consumers.

Vivo's Buzz Marketing for Smartphone Launches Vivo leverages influencer partnerships and viral campaigns to generate excitement around its smartphone launches, influencing consumer preferences.

Pinaki Mandal, (2019) Swiggy's Voice of Customer Campaigns Swiggy's creative marketing campaigns, such as "Swiggy Voice Of Hunger", encourage user participation and create organic buzz around the brand.

3. Objectives of the Study:

1. To analyze the role of buzz marketing in influencing consumer engagement and interaction with brands.

2. To examine the impact of buzz marketing on brand perception, trust, and credibility in competitive markets.

3. To evaluate how buzz marketing influences purchase decisions by leveraging psychological

triggers such as exclusivity, curiosity, and social belonging.

4. To identify the key digital marketing strategies used in buzz marketing campaigns and their effectiveness.

4. Research Methodology:

For this paper, the researcher has adopted a secondary research approach, gathering data from journals, magazines, websites, and articles. The authors have conducted an in-depth analysis of relevant literature and recorded data, leading to a well-supported conclusion aligned with the topic.

5. Findings of the Study:

5.1 Impact of Buzz Marketing on Consumer Engagement:

5.1.1 Increased Brand Awareness:

Buzz marketing helps brands gain rapid visibility as consumers actively share and discuss the campaign. When a marketing message spreads virally, it reaches a larger audience beyond traditional advertising efforts.

5.1.2 Enhanced Consumer Interaction:

Consumers engage with buzz marketing campaigns through likes, shares, comments, and participation in challenges. This high level of interaction strengthens brand-consumer relationships and fosters brand loyalty.

5.1.3 Influence on Purchase Decisions:

Since buzz marketing often originates from peer recommendations or influencer endorsements, consumers perceive it as more credible than direct advertisements. This influences their purchasing decisions and builds trust in the brand.

5.1.4 Emotional Connection and Brand Recall:

Memorable and emotionally charged buzz marketing campaigns create strong associations with a brand, increasing brand recall. Consumers are more likely to engage with and support brands that evoke positive emotions.

5.1.5 User-Generated Content and Community Building:

Many buzz marketing strategies encourage user participation, such as creating and sharing their own content related to the campaign. This fosters a sense of community and strengthens consumer engagement with the brand.

5.2 Impact of Buzz Marketing on Brand Perception:

5.2.1 Enhanced Brand Awareness and Visibility

Buzz marketing amplifies a brand's presence by encouraging organic sharing and discussions. When a campaign goes viral, it reaches a wider audience, reinforcing positive brand recognition.

5.2.2 Increased Trust and Credibility

Consumers often trust recommendations from peers, influencers, and social circles more than traditional advertising. Buzz marketing leverages this trust, strengthening the brand's credibility and authenticity.

5.2.3 Stronger Emotional Connection

Successful buzz marketing campaigns evoke emotions—whether humor, excitement, or inspiration. This emotional engagement fosters a deeper connection between the brand and its audience, improving brand affinity.

5.2.4 Differentiation and Competitive Advantage

A well-executed buzz marketing strategy helps a brand stand out in a crowded market. By offering unique and shareable experiences, brands can position themselves as innovative and trendsetting.

5.2.5 Improved Customer Engagement and Loyalty

Interactive buzz campaigns encourage consumer participation, leading to increased engagement. When consumers feel involved in a brand's story, they are more likely to develop long-term loyalty.

5. 3. Impact of Buzz Marketing on Consumer Behavior:

5.3.1 Influence on Purchase Decisions: Buzz marketing directly impacts consumer choices by influencing perceptions of brand authenticity and credibility. Consumers are more likely to purchase a product recommended by peers or influencers.

5.3.2 Brand Awareness and Engagement: Effective buzz marketing strategies enhance brand awareness by creating viral campaigns that capture consumer interest.

5.3.3 Trust and Credibility: Consumers trust peer recommendations more than traditional advertisements. Buzz marketing builds credibility by fostering organic discussions and authentic experiences.

5.3.4 Psychological Triggers: Buzz marketing appeals to psychological factors such as exclusivity, curiosity, and social belonging. Limited-time offers, influencer collaborations, and viral challenges create a sense of urgency and excitement.

5.3.5 Challenges and Ethical Concerns: Despite its benefits, buzz marketing presents challenges such as misinformation, over-hyped expectations, and ethical concerns related to transparency. Businesses must ensure authenticity and avoid deceptive practices.

6. Critical Analysis of Buzz Marketing:

Buzz marketing is effective in driving consumer engagement; its long-term sustainability and impact on brand loyalty require further investigation. Some campaigns may generate temporary hype but fail to translate into lasting consumer relationships.

Some brands create unrealistic expectations that may lead to consumer dissatisfaction.

Unethical buzz marketing tactics, such as fake reviews and paid promotions without disclosure, can damage brand reputation.

Overexposure to buzz marketing campaigns may lead to skepticism and reduced effectiveness over time.

Marketers must ensure transparency in their campaigns. Ethical buzz marketing strategies should prioritize honesty, avoid misleading tactics, and respect consumer autonomy.

7. Conclusion:

Buzz marketing is a powerful way to influence consumers by using social media, word-of-mouth, and viral content to spread brand awareness. This study shows that buzz marketing helps brands connect with customers, influence their buying decisions, and create strong emotional bonds. It works by using psychological triggers like curiosity, exclusivity, and social belonging to make brands more appealing. The findings reveal that buzz marketing improves brand image by increasing trust, credibility, and uniqueness in a competitive market. When done well, it boosts brand recall and customer loyalty. However, there are challenges, such as the risk of spreading misinformation, creating unrealistic expectations, and ethical concerns about transparency. To succeed, brands must ensure honesty and maintain consumer trust. While buzz marketing creates short-term excitement, its long- term success depends on matching consumer expectations with brand values. Companies should combine buzz marketing with traditional and digital marketing to keep their message clear and consistent. Future studies can explore how buzz marketing evolves in different industries and its long-term impact on brands Overall, buzz marketing is a strong and influential strategy in today's digital world. Businesses that use it wisely while staying ethical can build loyal and engaged customer communities.

References:

- Alwana, H. J. (2020). Buzz Marketing and its Role in Achieving Market Share. International Journal of Innovation, Creativity and Change, 12(7), 262- 282.

- Carl, W. J. (2006). "What's All the Buzz About? Everyday Communication and the Relational Basis of Word-of-Mouth and Buzz Marketing Practices," *Management Communication Quarterly (Mcq),* 19 (4), 601- 635. Publisher – Google Scholar – British Library Direct.

- Chebli Leila and Gharbi Abderrazak, January 2013, Article ID 584547, Journal of Marketing Research and Case Studies, 8 pages, DOI: 10.5171/2013.584547.

- García-Salirrosas, E. E., Acevedo-Duque, Á., Marin Chaves, V., Mejía Henao, P. A., &

Olaya Molano, J. C. (2022). Purchase intention and satisfaction of online shop users in developing countries during the COVID- 19 pandemic. Sustainability, 14(10), 6302. https://doi.org/10.3390/su14106302.

- Hind Naeem Hoshi, December, 2023, " THE IMPACT OF BUZZ MARKETING ON CUSTOMER
- PURCHASE INTENTION", International Journal of Studies in Business Management, Economics and Strategies, Volume 02, Issue 12, ISSN (E): 2949-883X, Scholarsdigest.org.
- Hooda, Sanjay, and Aggarwal, Sandeep, "Consumer Behaviour towards E-Marketing: A Study of Jaipur Consumers" Vol– III, Issue 2(2), April 2012.
- Johnsson, Johny K(2004), In Your Face: How American Marketing Excess Fuels Anti-Americanism Upper Saddle River, NJ: Person Education.
- Keller, K. L. (2003). Brand Synthesis: The Multidimensionality of Brand Knowledge, Journal of Consumer Research, 29(4), 595- 600. Retrieved from http://www.jstor. org/stable/10.1086/346254.
- Mirabi, V., Akbariyeh, H., & Tahmasebifard, H. (2015). A study of factors affecting on customers purchase intention. Journal of Multidisciplinary Engineering Science and Technology (JMEST), 2(1), 267-273.
- Mohr, I. (2007). Buzz marketing for movies. Business horizons, 50(5), 395-403.
- Morrissey, B. (2007). "Brands Infiltrate Social Circles to Create Buzz," Adweek, 48 (39), 14-15.
- P. Vikrant kumar and Dr. Chetan Srivastava, (2022), Effective Use Of Buzz Marketing For Brand Adoption And Mediating Role Of Customer Engagement Among Millennials And Centennials, Journal of Positive School Psychology, Vol. 6, No. 1, 113-122.
- Pinaki Mandal, Swiggy's "Voice of Hunger" Customer Campaign, International Research of Journal and Technology, Peer Reviewed Journal, ISSN: 2581- 7795, IRJET, Volume-02, Issue-06, June 2019.
- S. Kataria and R. Bhadale, IMPACT OF BUZZ MARKETING ON GEN Z OF SURAT CITY,
- Vidyabharati International Interdisciplinary Research Journal 11(2), ISSN 2319-4979, Dec. 2020, page. 304-308.
- Soundararaj, J.J., Arockia Baskaran, S., & Sivaprakkash, S. (2015). The Power of Buzz Marketing. Journal of Exclusive Management Science, 4(3), 44-53.

IMPACT OF AI-ENABLED SENTIMENT ANALYSIS ON CONSUMER ENGAGEMENT AND BRAND LOYALTY: A STUDY OF SOCIAL MEDIA MARKETING IN THE RETAIL INDUSTRY

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Abstract:

Integration of artificial intelligence (AI) into the marketing of social media has transformed the way the brands work with consumers, relationships and support loyalty. This document examines the impact of the Sentiment of Sentiment supported by AM on the involvement of consumers and a brand loyalty with a special focus on the retail industry. The AI sentiment analysis tools monitor and interpret customer emotions, provide real -time knowledge that help brands to adapt their message, improve customer experience and predict loyalty trends.

This study, which uses access with mixed methods, uses both qualitative and quantitative data, including surveys, interviews and reviews of literature, to assess how AI technology affects consumers' behavior. Research identifies key metrics of consumers, such as the degree of clickthrough, customer satisfaction and the frequency of social media interaction, exploring their relationship with marketing strategies on AI. In addition, it emphasizes the importance of real -time feedback in improving brand loyalty and maintaining customers.

Finding out of the study reveals that analysis of AI sentiment increases marketing efficiency by allowing hyper personalized content, immediately addressing customers' concerns and improving the overall perception of the brand. This not only drives deeper engagement but also strengthens the long -term loyalty of the brand. The contribution also discusses the practical consequences of receiving AI -controlled tools and provides retailers that seek to optimize the location of the brand on the competitive digital market, recommendations that can be optimized.

Overall, research emphasizes that the AF sentiment analysis plays a decisive role in the formation of relationships with the consumer brand and offers insight into future trends and applications in AI -based digital marketing.

Keywords: AI-enabled sentiment analysis, consumer engagement, brand loyalty, social media marketing, retail industry, digital marketing, AI-based tools, brand positioning

1. Introduction:

The rapid development of artificial intelligence (AI) has brought transformation changes in various industries, while the retail and electronic trading branches have witnessed significant disruptions. One of the most influential AI applications is the marketing of social media, where AI technology has improved the way the brands connect, engage and maintain customers. In this revolution of digital marketing, tools for analysis of the AI -controlled sentiment have appeared, allowing brands to decode customers' emotions, opinions and real -time feedback. These tools process large volumes of unstructured data, such as social media posts, customer reviews and online comments, and translate them into action knowledge that manages personalized marketing strategies and improves consumer experience.

In an era where digital interactions are increasingly forming the perception of the brand, the understanding of customers' sentiment has become key to achieving a competitive advantage.

Unlike traditional marketing techniques, the analysis of sentiment with support A, and allows retailers to move to the level of the surface level by immersing deeper into the patterns of customers' sentiment. This allows buyers to predict consumers' conduct, adapt marketing campaigns and quickly address negative comments, improving logo photo and helping confidence. Retail buyers now are better ready to apprehend the tendencies of customers' engagement, are expecting destiny shopping intentions and enhance their branded reports primarily based at the dynamic sentiment of consumers.

The aim of this study is to explore the impact of the Sentiment analysis with the possibility of AF on the involvement of consumers and the brand loyalty in the retail industry. Research seeks to explore how AI technology affects key marketing metrics, such as the frequency of customer interaction, clicks, online reviews, and a degree of maintenance. By using advanced AI sentiment instruments, retailers can increase customer satisfaction, improve the brand location and cultivate long -term loyalty in the hyperkockony digital landscape.

Moreover, the integration of AI into marketing is limited to analysis of emotions; It plays a key role in providing hyper personalized experiences that have become a characteristic feature of efficient modern marketing. Customized advertising, allowed Insights AI, allows brands to create targeted messages that resonate with customers' alternatives and desires. This stage of personalization strengthens customers' connection, leading to deeper involvement, growing logo loyalty and enhancing sales overall performance.

The goal of the studies is to identify the opportunities, challenges and practical effects of accepting marketing techniques of AI in the retail region. It will analyze the trends of consumer sentiment and explore the relationship between customer involvement with AI support and brand loyalty. In addition, the study will investigate how AI can address potential distortion in the algorithms of sentiment analysis to ensure inclusion and justice in marketing practices.

In short, this study seeks to provide comprehensive understanding of the role of sentiment analysis with support and forming marketing strategies, increasing consumers' involvement and optimizing brand loyalty. The aim of this research is to explore qualitative and quantitative data, including existing research, surveys and interviews with experts in the field, to contribute valuable knowledge for retail companies that want to maximize the potential of AI in digital marketing.

This introduction sets the basis for deeper research of AI, consumers' engagement and brand loyalty, and underlines the growing importance of AI sentiment to form retail marketing.

2. Background of the Study:

Social media platforms have evolved into effective tools for traders in the current digital era to interact with customers, increase brand recognition, and support customers loyalty. Retail traders have an unrivaled chance to improve customer experience, measure consumers' behavior, and the fortification of the brand's presence by connecting with millions of real -time users through platforms such as Instagram, Facebook, Twitter and LinkedIn. Social media serves as a dynamic environment where brands are continuously evaluated based on their interactions with customers, thanks to billions of active users who share opinions, reviews and feedback online. As a result of this shift, the need for increasingly sophisticated tools for effective monitoring, evaluation and respond to these meetings has increased.

In this context, artificial intelligence (AI) has become a converter of games, transformed conventional marketing tactics by facilitating data -based decision -making and a more detailed view of consumers. Sentiment analysis, AI -powered method that evaluates tone, emotions and sentiment of material generated by the user by processing natural language (NLP), machine learning (ML) and data analysis is one of the main uses of AI in the marketing of social media. Sentiment analysis reveals basic emotions mediated in tweets, reviews, comments and posts, and exceed just tracking of keywords. This allows traders to identify changes in consumer opinions, understand how their brand can be seen, and actively solve new trends or problems.

The retailers now have a better chance to improve their brand location and adapt their interaction strategies to integrate the research of sentiment A-released into the marketing of social media. Brands can reduce the risks of reputation by adapting their content, design items that suit consumers' taste, and immediately deal with unfavorable reviews using real -time sentiment analysis. By strengthening a deeper relationship between brands and their clientele, it supports sensitivity in real time greater engagement, greater satisfaction and permanent loyalty. In addition, traders can use a sentiment analysis to monitor marketing efforts, monitoring interactions with customer services, and determining important aspects that affect consumers' decisions.

Businesses traditionally use focus groups and conventional customer surveys to learn about consumers' preferences and brand perception. However, to limit the sample size, response time and data loyalty, these approaches often caused feedback that was either delayed or insufficient. Retail traders can now collect and analyze huge volumes of real -time data from different sources thanks to artificial intelligence (AI) and analysis of large data, which provides more thorough and more accurate understanding of the customer's sentiment. As a result, marketing of social media becomes more dynamic, more focused and predictive activities.

Accepting an AF sentiment with the possibility of AF is not without difficulty, despite many benefits. To ensure the effectiveness of the instruments for sentiment analysis, it is necessary to solve several fundamental problems, including distortion in AI algorithms, concerns about personal data protection and difficulty detection of complex human emotions. In addition, some brands lack infrastructure, financing or technical know-how to use AI efficient use in its marketing campaigns, resulting in different degrees of adoption in the retail sector.

This study focuses on how AI has changed the marketing of social media and how it affects the loyalty and involvement of customers in the retail industry. The study intends to identify the main forces worthwhile, problems with and proven procedures related to the analysis of sentiment with the possibility of AF reviewing the body of existing literature, conducting surveys and gaining opinions from professionals in the field. In the increasingly competitive digital ecosystem, the studies will offer retailers to the bright proposals to improve their digital marketing tactics, increase consumer satisfaction and cultivation of permanent brand loyalty.

3. Objectives of the Study:

1. Look at how to analyze the sentiment driven AI affects the interaction with customers in the retail sector.
2. Explore how social media marketing uses AI techniques affects the maintenance and loyalty of the brand.

4. Significance of the Study:

This study is of great importance for digital traders; retail companies and research workers focused on AI marketing innovations. By exploring the impact of a Sentiment analysis with AI support on the involvement of consumers and the brand loyalty, it offers valuable knowledge about how AI can transform traditional marketing strategies. Research emphasizes practical applications of AI tools in optimizing marketing campaigns, personalization of interactions with customers and improvement of overall brand location in the highly dynamic digital landscape.

For digital traders, the study underlines the importance of using AI to gain knowledge of real -time consumer sentiment, which can help increase customer satisfaction, reduce negative feedback and strengthen customer relationships. Retail companies can benefit from this research by learning how AI -based sentiment can be integrated into their social media strategies to monitor the brand's reputation, identify emerging trends and adapt marketing reports to suit customer needs more efficiently.

In addition, this study contributes to academic research by dealing with gaps in the existing literature on the role of AI in the marketing of social media and offers the basis for further exploring AI applications in the retail sector. By demonstrating the impact of a sentiment analysis with AI on key performance metrics such as customer involvement, loyalty and sales, this research provides special recommendations for companies that seek to gain a competitive advantage in today's digital economy driven by AI.

5. Hypotheses:

1. **H1:** AI-enabled sentiment analysis significantly impacts consumer engagement on social media platforms in the retail industry.
2. **H2:** AI-enabled sentiment analysis positively influences brand loyalty in the retail sector by improving personalized marketing strategies.

6. Literature Review:

Goyal, S., Esposito, M., & Sergi, B. S., This work shows a thorough overview of literature on Business Development Services (BDS) for micro, small and medium -sized enterprises (MSME). He looks at the historical BDS patterns, representing problems and potential future trips. The authors emphasize how key BDS initiatives are key to MSMES expansion and long -term viability. The main problems include the absence of supportive infrastructure and limited access to financing, training and consulting services. The report also points out that private companies, NGOs and governments are important to play in providing BDS to increase MSME competitiveness.

The analysis of previous studies, reports and statistical data is part of the research technique. The authors evaluate the effects of BDS on the performance of MSME classifications to various areas of services, including marketing, training and financial services. The results emphasize the importance of localized and adapted BDS strategies and suggest that digital transformations - specifically automation and artificial intelligence - are likely to change the way BDS is provided in the future. The research gap emphasizes the need for further empirical investigation, which focuses on the use of AI in increasing the provision of services and digital BDS tools.

In 2023, HubSpot, this study examines how interaction and digital sales of AI become increasingly important in current sales tactics. It emphasizes how growing digitization, remote work and development AI caused a shift in paradigm in a sale. The research is highlighted with AI -controlled sales solutions that increase lead generation, increase clients' involvement and accelerate communication. In addition, it identifies new trends that are important factors of sales efficiency such as conversational AI, predictive analysts and adapted interactions.

The HUSSPOT study is based on industrial data and surveys of sales experts around the world. According to the results, companies using AI tools work better than conventional sales teams in terms of clients' happiness and conversion levels. However, problems including talent gaps, tool integration and data protection are still the main obstacles. The absence of long -term studies evaluating the long -term effects of AI sales tools on the company's results were recorded as a research gap.

Subban, M. and Makhaye, A. C. (2021), This study focuses on how small businesses have adapted to the problems caused by the outbreak of COVID-19 and "new normal". Writers focus on how business and business tactics support small businesses to compete. Online marketing, digital transformations and use AI and automation in business processes are some of the main topics. According to a report, small companies that have accepted creative marketing techniques and technology were better during the pandemic.

The research process includes an overview of recent literature and qualitative interviews. According to research, while many small companies have experienced operating disruptions, those who used the technology driven AI to involve consumers, such as chatbots and platforms of electronic trading, have seen more results. To improve the flexibility of small enterprises, the study also emphasizes the need for greater government assistance, digital training and accessible, at a reasonable price of AI tools.

Salesforce (2023), In this study, the effect of AI and CRM (Management Relationship Relationships Management) technologies is examined on worldwide sales performance. It names AI controlled CRM systems as important facilitators of predictive analysis, customer personalization and sales automation. By automating recurring processes and offering useful knowledge, it shows how AI integration increases lead management, sales prognosis and customer experience.

Professional interviews and worldwide sales success were used as a study foundation. The results show that businesses using CRM -powered AI solutions have seen a remarkable increase in income growth, maintaining clients and sales productivity. However, problems including employees training, data quality control and tool integration have also been recorded. An identified research gap is needed to focus on other studies that focus on CRM applications relevant to a particular industry and the long -term impact of AI acceptance on sales dynamics.

In 2023, McKinsey & Company, the future of sales is examined in this article with regard to automation, artificial intelligence and digital sales team growth. It emphasizes how the AI revolutionizes the sale process by improving the sales forecast, by automating lead scoring and allowing hyper personalization. The key trends that McKinsey identifies as essential for future sales performance includes digital customer involvement, real -time data analysis, and AI -driven assistants.

McKinsey determines proven procedures for integration AI and automation into sales teams based on a thorough investigation that includes case studies, industrial surveys and data analysis. According to research, businesses that use sales tactics have a better chance of improving the customer's happiness, increasing sales production and getting a competitive advantage. However, the study also draws attention to problems, including employees' resistance, lack of skills and moral dilemmas surrounding the AI application. A more empirical study on the long -term effects of AI on interactions with customers and the dynamics of the sales team is required to fill in the research gap.

7. Research Methodology:

The research adopts a mixed-method approach, combining quantitative surveys and qualitative interviews to explore the impact of AI-enabled sentiment analysis on consumer engagement and brand loyalty in the retail industry.

- **Sample Technique:** Stratified random sampling of retail consumers active on social media.
- **Sample Size:** 200 respondents from various demographic and geographic backgrounds.
- **Data Analysis Tools:** SPSS for quantitative analysis
- **Tests:** Regression analysis, correlation tests, and thematic analysis were used to evaluate the hypotheses and draw actionable insights.

Data Analysis

H1: AI-enabled sentiment analysis significantly impacts consumer engagement on social media platforms in the retail industry.

Regression Statistics	
Multiple R	0.817439
R Square	0.668206
Adjusted R Square	0.65457
Standard Error	0.671144
Observations	201

ANOVA					
	df	SS	MS	F	Significance F
Regression	6	176.8918	29.48197	78.54289	0.00
Residual	195	87.83456	0.450434		
Total	201	264.7264			

	Coefficients	andard Err	t Stat	P-value	Lower 95%	Upper 95%	ower 95.0%	pper 95.0%
Intercept	0.505905	0.430129	1.176172	0.24096	-0.3424	1.354207	-0.3424	1.354207
I find retail brands' AI-powered social media responses relevant to my queries and concerns.	0	0	65535	0	0	0	0	0
AI-generated responses from retail brands enhance my interaction experience on social media.	0.203864	0.064818	3.145176	0	0.07603	0.331699	0.07603	0.331699
I am more likely to engage with brands that provide timely AI-generated feedback on social media.	0.678987	0.152799	4.443655	0.00	0.377636	0.980339	0.377636	0.980339
AI-powered sentiment analysis helps retail brands to address consumer complaints quickly.	-0.43973	0.040284	-10.9158	0.00	-0.51918	-0.36028	-0.51918	-0.36028
Retail brands' AI-based social media interactions make me feel more connected to the brand.	0.726822	0.06673	10.89202	0.00	0.595218	0.858427	0.595218	0.858427
AI-enabled recommendations by retail brands on social media align with my interests.	-0.39504	0.051225	-7.71186	0.00	-0.49607	-0.29401	-0.49607	-0.29401

1. Regression Statistics

- **Multiple R (0.817)**: This is the correlation coefficient, which indicates a strong positive relationship between the independent variables (AI-powered responses, AI-generated interaction, etc.) and the dependent variable (consumer engagement or loyalty).
- **R Square (0.668)**: This indicates that 66.8% of the variance in consumer engagement and brand loyalty is explained by the independent variables in the model.
- **Adjusted R Square (0.655)**: This accounts for the number of predictors in the model and is slightly lower than R Square, showing that the model is still well-adjusted for the variables.
- **Standard Error (0.671)**: This shows the average distance that the observed values fall from the regression line, with a lower value indicating better model fit.

2. ANOVA (Analysis of Variance)

- **Significance F (0.00)**: This value is highly significant, meaning that the overall regression model is statistically significant, and the independent variables collectively influence the dependent variable.
- **F-Statistic (78.54)**: A high F-value indicates that the model provides a better fit than a model with no independent variables.

So major p value is 0.00, so alternate hypothesis is accepted.

H2: AI-enabled sentiment analysis positively influences brand loyalty in the retail sector by improving personalized marketing strategies.

	AI-driven personalized marketing efforts by retail brands increase my loyalty to the brand.	I am more likely to stay loyal to brands that offer AI-based personalized product recommendations.	AI-powered personalized advertisements by retail brands make me feel valued as a customer.	I prefer shopping with brands that remember my preferences through AI-based personalization.	AI-enabled sentiment tracking helps retail brands to offer more personalized discounts and offers, improving my loyalty.	I trust brands more when they use AI to personalize my shopping experience.	AI-driven personalized marketing communications make me more inclined to choose a specific retail brand.	Personalized marketing messages based on AI-powered sentiment analysis make me more likely to recommend the brand to others.
AI-driven personalized marketing efforts by retail brands increase my loyalty to the brand.	1							
I am more likely to stay loyal to brands that offer AI-based personalized product recommendations.	-0.4062	1						
AI-powered personalized advertisements by retail brands make me feel valued as a customer.	-0.10212	-0.67923	1					
I prefer shopping with brands that remember my preferences through AI-based personalization.	1	-0.4062	-0.10212	1				
AI-enabled sentiment tracking helps retail brands to offer more personalized discounts and offers, improving my loyalty.	-0.10212	-0.67923	1	-0.10212	1			
I trust brands more when they use AI to personalize my shopping experience.	0.100362	0.106679	-0.15426	0.100362	-0.15426	1		
AI-driven personalized marketing communications make me more inclined to choose a specific retail brand.	-0.23696	0.530357	-0.33894	-0.23696	-0.33894	-0.33936	1	
Personalized marketing messages based on AI-powered sentiment analysis make me more likely to recommend the brand to others.	0.710173	-0.40696	-0.1351	0.710173	-0.1351	0.170499	-0.33966	1

Based on observed strong correlations (e.g., r = 0.710, r = -0.679) in some pairs:

- If these correlations are significant ($p < 0.05$), you may reject the null hypothesis (H_0) and conclude that AI-driven personalized marketing does impact customer loyalty and trust.

8. Findings and Discussion:

8.1. A positive impact on consumers involvement

Personalization by analyzing AI sentiment:

AI tools that analyze consumers' sentiment allow retailers to see how customers feel about products, services and marketing campaigns in real time. By understanding the emotions and preferences of customers, retailers can adapt their interactions and marketing reports to increase consumers' involvement.

For example:

Ai -based sentiment tools can detect whether customers react positively or negatively to social media campaign and automatically modify future messages based on this knowledge.

Personalized offers, discounts or products derived from customers' sentiment help create more adapted and more engaging shopping experiences.

Feedback and adaptive marketing strategy in real time:

One of the key advantages of AI sentiment analysis is its ability to provide real -time feedback.

Retailers can quickly discuss consumer feedback by identifying dissatisfaction in time and actively solving it. For example, if the product is launched on the market, an increase in negative sentiment, AI may notify the brand to implement immediate corrective measures such as issuing apologies, offering compensation or editing marketing language.

This sensitivity leads to higher customer satisfaction, which strengthens involvement and supports repeated interactions.

8.2. Strengthening the brand loyalty

Analysis of sentiment with support and also plays a decisive role in building long -term loyalty by improving trust and creating a more personalized customer experience. Key mechanisms for this improvement include:

Building confidence through tracking sentiment:

Customers tend to trust brands that demonstrate awareness and understanding of their preferences and concern. By using AI -driven tools to assess the feedback and sentiment of customers, brands can:

Show empathy by recognizing consumer concerns and acting on them,

Offer timely relevant solutions (such as personalized discounts or support) and

Transparently to be confidence and loyalty.

Example: If the customer has a complaint about delayed delivery and AI detects a negative sentiment in their communication, the system can trigger immediate subsequent actions such as e-mail apology, accelerated delivery or discount on future purchases.

Strengthening loyalty through personalized marketing:

AI can increase loyalty by providing marketing messages that deeply resonate with individual customers. By watching and analyzing your customer's sentiment, brands can:

Identify loyal customers and reward them with special offers or loyalty points, Create segmented campaigns based on emotional triggers (eg promotion of ecological products for customers with environmental awareness) and

Strengthen positive experiences with customers to support repeated business and recommendations to others.

This personalized marketing effort supports the emotional connection between customers and the brand, the key driving force of loyalty.

8.3. A loop focused on sentiments: building a cycle of engagement and loyalty
Ai sentiment analysis can create a loop of positive feedback for retailers:

Increased wiring leads to a higher level of interaction (eg multiple purchases, social media involvement),

This in turn generates more sentiment data, which allows the brand to further specify its personalization efforts, As consumers see their preferences and feedback that reflect in the marketing and services of the brand, their trust and loyalty grow and complete the loop.

Key knowledge of monitoring sentiment in real time:
Based on the study, it emphasizes how the benefits of monitoring sentiment based on AI in real time of retailers and consumers:

For retailers: provides special information about customer behavior and helps brands remain agile and helpful.

For consumers: increases their overall experience by ensuring that their votes will be heard, recognized and solved.

8.4. Practical consequences for retailers:
Finding out several practical applications for analyzing sentiments with AM support in the retail industry:

Improvement of customer experience: retailers can use AI to optimize customer experience by providing relevant personalized content in real time.

Brand Reputation Management: By actively monitoring sentiment, the brands can more effectively manage the potential PR crises and solve negative feedback before escalating.

Target marketing: Sentiment analysis allows customers to segment more, allowing retailers to target specific groups using adapted marketing messages.

8.5. Challenges and restrictions:
While the finding shows clear benefits of AI sentiment analysis, certain challenges may reduce its efficiency:

Privacy and data ethics: Since AI tools analyze sensitive customer data, the brands must ensure compliance with data protection regulations to maintain customer confidence.

Algorithmic bias: AI models may inherit distortion from training data, which potentially leads to inaccurate detection of sentiment and unintended marketing consequences.

Excessive personalization: Excessive personalization could be perceived as invasive or manipulative, so the brands must achieve balance to avoid stunning customers.

9. Conclusion and Future Scope:
Conclusion: The study emphasizes that the AI sentiment analysis has appeared as a powerful and transformation tool for strengthening various aspects of retail marketing, especially in optimizing brand location and improving customer involvement. The use of AI tools that can detect and analyze real -time customers are better equipped to understand their target audience, predict consumers' needs, and provide highly personalized experiences.

9.1. Optimization of the location of the brand with the analysis of sentiment controlled AI
The location of the brand concerns how consumers are perceived by the brand in relation to its competitors. AI sentiment analysis helps brands to improve their location by watching how customers feel about brand, products, services and marketing campaigns.

Understanding consumers' perception: AI tools analyze large volumes of feedback from customers from multiple sources, including social media, reviews of customers and surveys. This analysis helps brands to determine what aspects of their offers resonate with customers and what aspects they require improvement.
For example, if AI finds that customers appreciate the environmental procedures of retail brands, the company can strengthen its location around sustainability.

Real -time brand adjustments: Since AI can follow real -time sentiment, brands can quickly adjust their marketing strategies and communication based on customers' responses. This helps in placing a brand as a brand that listens to its customers and responds to their needs.
Example: A sudden increase in a positive sentiment during a marketing campaign can make the sign to reinforce the campaign, while a negative sentiment can lead to rapid damage to damage.

9.2. Strengthening customer involvement
Customer involvement concerns the interactions and connections that customers have with the brand. Ai -controlled AI analysis increases the involvement of several ways:

Personalized engagement: Analizuju customers' sitliment can help brands to provide highly personalized experiences that correspond to the emotions and preferences of customers.
Example: Customers who express excitement of certain categories of products can receive targeted offers or recommendations and increase their probability of further involvement with the brand.

Responsive Customer Service: Sentiment monitoring in real time allows brands to immediately identify and solve customer concerns, promote trust and encouraging repeated interactions.
Example: If AI detects frustration in customer feedback, it can launch immediate subsequent events such as the offer of discount or providing additional support.

Building emotional connections: AI tools help the brands of craft marketing messages that evoke positive emotions, creating stronger emotional connections with customers and increasing loyalty.

Future Scope: Examination of Innovation AI
While the current study focuses on sentiment analysis, it also identifies future opportunities for research and innovation in AI marketing technologies. Two potential areas for future survey are:

A) AI Innovation in Augmented Reality Marketing (AR)
Augmented reality (AR) is a developing technology that mixes digital content with the real world and offers absorbing and interactive experiences. Innovation AI driven AI could transform the way the retailers work with customers.

Improved product visualization: AI-OPHOVAGE AR can enable customers to practically test clothes, accessories or makeup and help them make a more informed purchase decision. The sentiment analysis could follow their reactions to this experience, allowing further personalization. Example: AI virtual mounting room could offer personalized proposals based on past customer preferences and real -time responses.

Brand immersion: Ai-AR marketing campaigns could create unforgettable brand experience that evokes strong emotions and creates deeper connections with consumers. For example, AR filters on social media platforms could allow customers to participate in a branded content in a creative way.

AI sentiment-furnished AR Experience: Combination of sentiment analysis with AR could allow brands to adapt AR experiences based on customers' emotions. For example, if the customer seems to seem to be amazed during a virtual shopping experience, AI could adjust the interface to simplify navigation.

B) Blockchain -based loyalty programs
Blockchain technology, known for its transparency and security, has the potential to revolutionize customer loyalty programs by making them more transparent, safer and rewarding. Integration AI with blockchain could increase loyalty programs in several ways:

Transparent and loyalty fraud -resistant systems: Blockchain can ensure that loyalty points are safely monitored and that customers receive fair rewards for their involvement. AI could analyze customers' sentiment to adapt these rewards and increase their perceived value.

Token -based rewards: Blockchain -based tokens could be used as rewards that customers can apply across multiple brands or platforms. AI sentiment analysis could help identify the types of rewards that most resonate with customers, which will be more efficient loyalty programs.
Improved customer confidence: Because blockchain provides transparent transactions, it can help build confidence with customers, especially in industries where confidence is critical (eg luxury retail or ecological food). AI could further strengthen confidence by ensuring that loyalty programs are adapted to individual preferences and needs.
C) Potential instructions for future research:
Based on identified innovations, future research could explore topics such as:
Impact of AI driven AR on consumers' decision -making and brand involvement

How do they affect the experience with AI controlled AI and affect the behavior of consumers and emotional involvement with the brand?

What role does the analysis of the sentiment in real time play in the optimization of the AR Camp Marketing.

References:

1. Goyal, S., Sergi, B. S., & Esposito, M. (2018). Business Development Services for Micro, Small and Medium Enterprises – Literature Review of Past Trends and Future Directions. World Review of Entrepreneurship, Management and Sustainable Development, 14(3), 312–332.
2. HubSpot. (2023). Inside Sales Report: The Shift to Digital Selling and AI-Powered Engagement. Retrieved from https://www.hubspot.com/sales-trends-2023
3. Makhaye, A. C., & Subban, M. (2021). Entrepreneurship and Business Development in the 'New Normal': Can Small Businesses Adapt? Social Sciences International Research Conference, 649.
4. Salesforce. (2023). The Impact of CRM and AI on Sales Performance: A Global Study. Retrieved from https://www.salesforce.com/crm-impact-report
5. McKinsey & Company. (2023). The Future of Sales: AI, Automation, and the Rise of Digital Sales Teams. Retrieved from https://www.mckinsey.com/business-functions/growth-marketing-and-sales/our-insights/future-of-sales

MANAGEMENT OF INNOVATIVE MARKETING TOOLS AS AN EFFECTIVE BUSINESS TOOL

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Abstract

Establishing a foothold and attaining or sustainable growth Are ongoing challenges for today's entrepreneurs in this competitive Business environment. New marketing strategies have become effective instruments for surviving in the cutthroat market.

The report commences by highlighting the critical role of strategic adaptation within organizations. It emphasizes the need for entrepreneurs to be agile and responsive to market shifts, underlining the value of strategic decision making and execution in achieving organizational goals. This foundation sets the stage for exploring the concept of innovative marketing techniques.

Drawing on established literature, the report defines innovation in marketing as the creation of novel approaches that deliver value to both consumers and the organization. It goes beyond simply introducing new products, encompassing fresh strategies for communication, customer engagement and value delivery. The report explores how innovation in marketing fosters sustainable development and competitive differentiation.

The core of the research focuses on the management of these innovative techniques it emphasizes the importance of entrepreneurs possessing entrepreneurial and innovative characteristics. By drawing a connection to Schumpeter's work, the report positions the entrepreneur. As an agent capable of introducing new products and services through technological advancements

The report then into different categories of innovative marketing strategies, potentially including content data-driven marketing, social media marketing. Came on the established foundation, the report explores how entrepreneurs can effectively manage these techniques. The report concludes by highlighting the significance of continuous learning and adaptation within the entrepreneurial marketing landscape. Entrepreneurs should stay informed about emerging trends and technologies in marketing to ensure their techniques remain relevant and effective. The research contributes to the broader field of entrepreneurship by providing valuable insights on how innovative marketing techniques can be harnessed to achieve competitive advantage and drive business growth.

Introduction

Establishing and expanding their businesses is a never-ending task for entrepreneurs in today's fiercely competitive and quickly changing business environment. Even while they are still effective, additional marketing strategies frequently failed to draw in today's discriminating consumers. This study explores the vital role that creative marketing strategies play as effective business instruments for entrepreneurs looking to establish market distinction and sustained success.

Finding opportunities and adding value is the whole of entrepreneurship effective communication and interaction with the target audience are necessary to convert this value into real economic success, do filter this is where creative marketing comes into play, providing a flexible and dynamic strategy to handle the intricacies of contemporary marketplaces. Entrepreneurs may create strong brand identities, meaningful connections with their customers and eventually revenue grew by utilizing data giving insights, innovative methods and developing technology.

Early on its history, entrepreneurial marketing had its share of critics, as in the case most newly established research areas. Scholars and practitioners have long sought to understand what makes a firm effective, which has led to a focus on the firm in entrepreneurship study (Scott and Rosa, 1996)

The notions of which market to target, how price and quality are related, what buyers are ready to pay, and what sales promotion strategies can be employed for successful marketing are all poorly understood by entrepreneurs. For there to be consumer awareness and demand, all these elements must exist. We must take a straightforward approach to the marketing issues to make these things simple for business owners. (S.A. Juyal and A. Nautiyal 2022).

Finding the elements that lead to the development of a competitive advantage is essential for any organisation to succeed in the current dynamic competitive climate if it hopes to maintain or grow its market share and advance its competitive position.

Review of Literature

A qualitative interpretivist approach to entrepreneurial marketing strategy in craftbased enterprises in emerging markets (Suruchika Gupta, Ateeque Shaikh and Abrar Ali Saiyed article publication date: Nov 2023).

This study offers valuable insights into the unique marketing approaches of craft base microenterprises in India. Future research with a broader sample and exploration of implementation aspects would strengthen the understanding in this area.

The story of ethnic minority entrepreneurs in the UK demonstrates entrepreneurial marketing in online enterprises. (Anwar, Muhammad Naveed, Elizabeth Denial, Article publication date: June 13, 2016).

This research provides insightful information on the marketing strategies used by ethnic minority entrepreneurs with online businesses. The study brings a fresh perspective by examining online businesses as a potential avenue for ethnic minority entrepreneurs to move beyond traditional sectors.

Restaurants operators in India and the UK share their experiences with using digital marketing tools in their independent enterprises (Kamal Manaktala, Swati Dabas and Swati Sharma Article publication date: May 13,2021).

This study explores an important topic in the restaurant industry: the youth of digital marketing resources by restaurants owners into two contrasting markets, India and the United Kingdom. The study sheds light on how restaurant owners in these countries are adapting to the digital shift in customer behavior.

The development of social media as an entrepreneurial marketing tool. (Jennifer Dangelo of Tennessee technological university and Petric R. Geho of Middle Tennessee State University Article publication date: Jan 2012).

This study highlights the increasing significance of marketing on social media for entrepreneurs and the shift from impracticality to a data driven approach. The study emphasizes the changing social media landscape, where advancements have addressed the previous limitations and made social media marketing a viable option for entrepreneurs.

Innovative marketing for entrepreneurial success. (Som Adiya Juyal, Amit Nautiyal Article publication: March 2022)

The study highlights few things that the traditional marketing products may not be sufficient for the entirely new products, Entrepreneurs need to understand the challenges of marketing radical innovation, Entrepreneurs need to focus on creating values for customers.

Future research, conceptual frameworks, models and systematic studies of entrepreneurial and innovation tactics. (Juliana Carvalho Sousa, Kleber Nobrega, Wenyka Costa and Luiz Antonio Felix Junior Article publication date: April 2020).

This study provides a good foundation for understanding the existing literature on entrepreneurial and innovative strategies.

Marketing tools in stimulating innovative activity of enterprises. (Olena Sadchenko, Volodymyr Lagodiienko, Innola Novykova Article publication date: 6, June 2020).

The study highlights the low level of innovation activity among Ukrainian companies and emphasizes the increasing importance of Internet marketing in today's business environment. It also investigates how a company's marketing system, both internal and external, can drive innovation.

Unleashing the Creativity of Entrepreneurs with Digital Technologies. (Robert D. Hisrich

and Mariusz Soltanifar Article publication date: July 2021).

This book explores the concept of digital entrepreneurship, focusing on how digital technologies and business models are reshaping entrepreneurship, business, and society. It contains contributions from scholars worldwide, bridging theory and practice with case studies and practical tools.

Objectives

- Identifying which innovative marketing techniques are most successful for startups and small businesses.
- Evaluating the effectiveness of various marketing techniques in achieving business goals.
- Identifying the unique challenges entrepreneurs face when adopting innovative marketing approaches.

Research Methodology

The utilization of creative marketing strategies as useful business tools for entrepreneurs was examined in this study using a mixed-methods approach.

This method offers a thorough grasp of the research subject by using qualitative and quantitative components.

Literature evaluation (secondary data): To provide a theoretical framework for the students an extensive evaluation of the body of current literature was carried out

Secondary data sources were analyzed for this analysis, including industry reports, publications from respectful organisations and scholarly articles in academic databases.

Books about innovation, marketing and entrepreneurship. This reference includes citation to the sources utilized for the literature review.

Information gathering:

Case studies: Mostly secondary information several case studies of business owners who have effectively used cutting edge marketing strategies were examined. These case studies were chosen to reflect a variety of business sizes, marketing strategies and industries. The primary source of case studies was secondary research, these includes:

- Marketing materials and company websites.
- Market research and industry magazines.
- News articles and business journals.
- Marketing specialists were interviewed.

Primary data from these interviews provide important insights into the field difficulties, best practices and current trends.

Questionnaire survey (primary data): To collect quantitative information of creative marketing strategies by a sample of entrepreneurs, a questionnaire survey was sent to them.

Data Analysis

This section details the methods used to analyze both secondary and primary data to gain a comprehensive understanding of the role of innovative marketing techniques for entrepreneurs.

Secondary Data Analysis

I concentrated my analysis on research that advances our knowledge of creative marketing strategies and how entrepreneurs employ them. My main interpretations are highlighted by the following points:

Recognising Various Entrepreneurial Situations: "I've looked at studies that investigate entrepreneurial marketing in diverse settings. Gupta, Shaikh, and Saiyed (2023), for example, offer a qualitative viewpoint on craft-based microbusinesses in developing nations like India. This is important because it emphasises the necessity of tailoring creative marketing techniques to certain cultural and economic contexts. Like this, Anwar and Denial (2016) concentrate on ethnic minority business owners in the UK, stressing the value of considering a variety of entrepreneurial groups and the function of online platforms for them.

The Growing Significance of Digital Marketing: "The growing significance of digital marketing is one of the major themes I found. To demonstrate the global trend towards digital strategies, Manaktala, Dabas, and Sharma (2021) examine the use of digital tools in the restaurant industries in India and the UK. Additionally, the evolution of social media as an entrepreneurial marketing tool is carefully examined by Dangelo and Geho (2012), which is very pertinent to the results of my study on the efficacy of social media marketing.

Adapting to Innovation and Change: Several studies stresses how important it is for business owners to have flexible and creative marketing strategies. According to Juyal and Nautiyal (2022), entrepreneurs should concentrate on generating client value because standard marketing might not be enough for radical innovation. This supports the fundamental notion that innovative marketing involves a fundamental change in marketing philosophy rather than merely utilising new tools. A more comprehensive review of innovative and entrepreneurial tactics is given by Sousa et al. (2020), who also emphasise the necessity of ongoing research in this field.

The literature additionally emphasises the significance of technology and strategic application in creative marketing. According to Savchenko et al. (2020), marketing tools have the potential to foster innovation. In their exploration of the more general idea of digital entrepreneurship, Hisrich and Soltanifar (2021) highlight the ways in which digital technologies are changing the whole entrepreneurial scene. This relates to my research since it emphasises how crucial it is to deliberately incorporate new technology into business models in addition to simply accepting them.

All things considered, my examination of these literature studies shows that there is a significant focus on the necessity for entrepreneurs to be flexible, tech-savvy, and customer-focused in their marketing initiatives. It also emphasises how crucial it is to consider various situations and how marketing is always changing in the digital age.

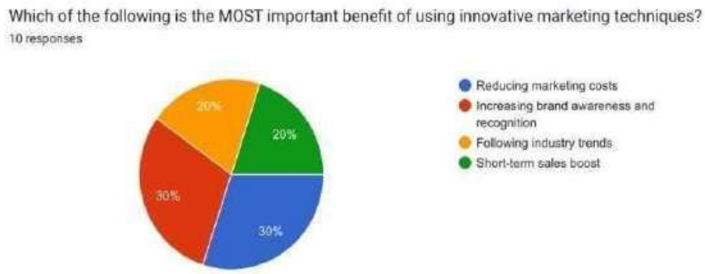
Primary Data Analysis

Entrepreneurs were given a questionnaire survey to complete in order to gather primary data. To find trends and make inferences on entrepreneurs' attitudes and application of creative marketing strategies, the survey's quantitative data was examined.

Thematic analysis was used to look at the qualitative information gathered from the case studies, export interviews, and questionnaires.

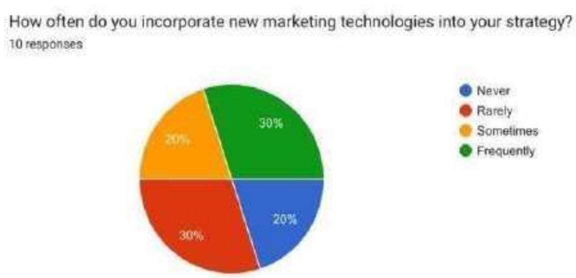
1. Perceived Benefits of Innovative Marketing:

Increasing brand awareness and recognition" was chosen by ten respondents as the most significant advantage of employing creative marketing strategies. It implies that when implementing new marketing strategies, companies should give top priority to increasing their visibility and building a strong brand identity.



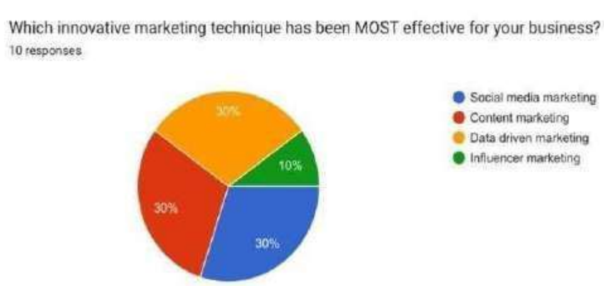
2. Adoption of New Technologies:

The information points to a well-rounded strategy for implementing new marketing technology. While half of the respondents "frequently" use new technologies, the other half "sometimes."



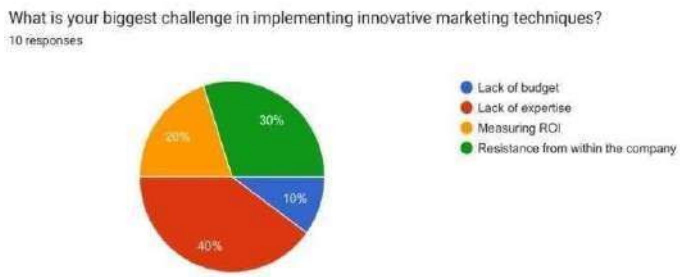
3. Effectiveness of Specific Techniques

The most successful new marketing strategy is thought to be social media marketing, which is closely followed by content marketing. This emphasises how crucial content production and internet platforms are to modern marketing tactics. Influencer marketing is now the least effective strategy in use, whereas data-driven marketing is regarded as the third most effective technique, despite its importance (as demonstrated in question 5).



4. Challenges in Implementation

The biggest obstacle faced by business owners when putting new marketing strategies into practice is calculating the return on investment (ROI). This implies that in order to evaluate the efficacy of these tactics, better instruments and measurements are required. Significant barriers include a lack of funding and experience, which highlights the value of training and development and resource limitations.

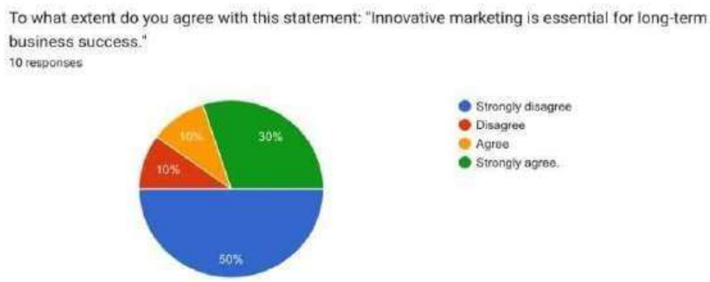


5. Importance of Data Analytics

The significance of data analytics in marketing choices is widely acknowledged. The vast majority of respondents rate it as "very important," highlighting how data-driven contemporary marketing is.

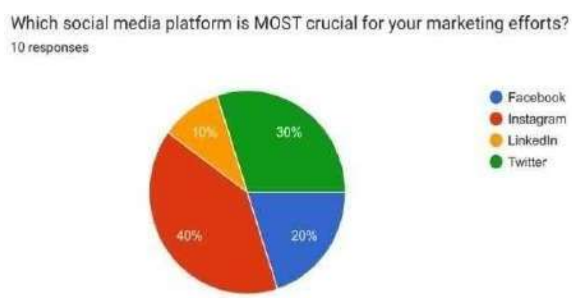
6. Agreement on the Importance of Innovative Marketing

This broad consensus supports the notion that entrepreneurs understand creative marketing is essential to sustained company success.



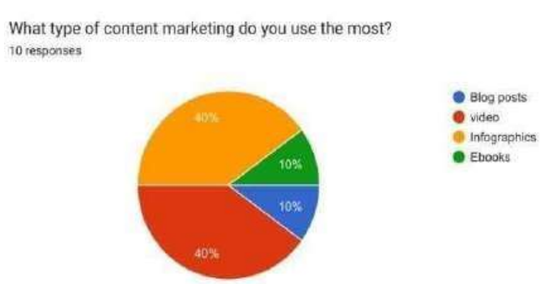
7. Crucial Social Media Platforms

Facebook and LinkedIn are also regarded as essential, while Instagram is marginally preferred. This implies a multifaceted strategy for social media marketing, where platforms are selected according to how relevant they are to the intended audience. This group seems to place less importance on Twitter.



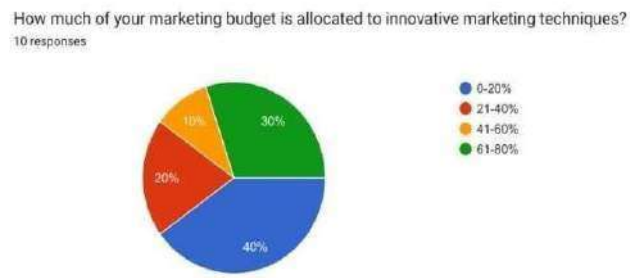
8. Content Marketing Preferences

The most widely used content marketing formats are blog entries and videos, suggesting a preference for textual and visual material. For these individuals, ebooks are not their first option, and infographics are utilised less frequently.



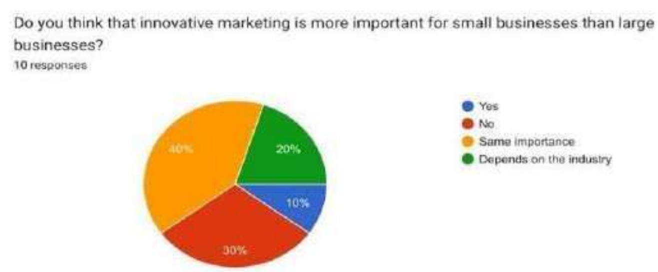
9. Budget Allocation

With the majority lying between 21 and 60 percent, the majority of respondents devote a sizeable amount of their marketing budget to creative approaches. This indicates a significant expenditure on creative marketing.



10. Importance for Small vs. Large Businesses

A clear majority believes that innovative marketing is more important for small businesses.



Results and Findings.

The study produced several findings on how entrepreneurs employ creative marketing strategies.

1. Perceived advantages of creative promotion

According to the survey findings, there is broad agreement regarding the main advantage of creative marketing. Increasing brand familiarity and awareness was cited by all respondents as the most significant advantage this demonstrates how entrepreneurs recognize the importance of creative approaches in building a powerful brand.

2. How often new technologies are adopted

A noticeable trend if the active adoption of new marketing techniques 50% of respondents said they occasionally adopt new technology compared to 40% who said they do it regularly.

3. The efficiency of method

Content marketing and social media marketing became popular strategies. 40% of respondents said social media marketing was the most effective, followed by content marketing that is 30% and data-driven marketing that is 20%. This is consistent with the knowledge that these tactics present substantial chances for brand development and consumer interaction.

4. Implementation difficulties

Data analytics is seen to be essential for marketing choices 20% was moderately significant and 60% said it was very essential 40% of respondents said that measuring ROI was their toughest issue 20% of responders cited lack of competence and lack of funds. This emphasizes the necessity of resources and tools that enable business owners to evaluate the success of their creative marketing initiatives.

5. Data analytics importance.

Data analytics is seen to be essential for marketing choices. Twenty percent said it was moderately significant, and sixty percent said it was very essential.

Impact of innovation marketing techniques:

Case studies investigation showed that innovative marketing techniques can greatly aid in accomplishing corporate objectives such as:

- Increased brand awareness and recognition
- Enhanced customer acquisition and retention
- Improved customer engagement and loyalty
- Growth in shares and market shares

Challenges in adopting innovative marketing techniques

Entrepreneurs faced several challenges when adopting innovative marketing techniques:

- Limited resources and budgets

- Lack of expertise and knowledge
- Difficulty in measuring ROI
- Rapidly changing technological landscape resistance to change and traditional mindset.

Suggestions

- Better training and development: Provide business owners with Training programmes that focuses on innovative marketing techniques
- Allocation of resources and assistance: Facilitate the acquisition of finances and resources that supports the use of innovative marketing strategies.
- Stress the importance of digital marketing, social media marketing: Particularly on platforms like LinkedIn. Twitter. and Facebook can increase brand exposure and customer engagement.
- Data-driven decision making: Encourage the integration of data analytics into marketing strategies to ensure Informed decision and optimise ROI.
- Adaptability and continuous learning: To keep up with the changing marketing entrepreneurs, should be encouraged to adopt a mindset of adaptability and continous learning.

Conclusion

- According to this study innovative marketing strategies are essential for empowering business to successfully compete and achieve long term company growth.
- The results highlight how crucial it is for business owners to adopt a proactive and flexible marketing strategy, utilising new tools and techniques to connect with their target market and establish powerful brand.
- According to the survey innovative marketing techniques involves more than just implementing new technologies, it also entails cultivating an innovative, experimental and customer focused culture.
- Entrepreneurs are more equipped to overcome obstacles and size chances in the fast-paced business world if they place a high priority on lifelong learning, adjust to changes in the market and successfully oversee creative marketing strategies.
- By offering useful insights on the implementation and administration creative marketing strategies the study advances our knowledge of entrepreneurial marketing.
- Additionally, it highlights the main obstacles faced by the entrepreneurs, providing a basis for further study and assistance programs meant to encourage efficient marketing strategies among new and small enterprises.

References.

- Dangelo, J., & Geho, P. R. (2012). The development of social media as an entrepreneurial marketing tool. Arden Vol. 17, 61-68.

- Dabas, S., Sharma, S., & Manaktola, K. (2021). Adoption of digital marketing tools
- in independent businesses: Experiences restaurants entrepreneurs in India and United Kingdom.
- Worldwide Hospitality and Tourism Themes, ahead-of-print(ahead-of-print).
- Gupta, S., Shaikh, A., & Saiyed, A. A. (2023). A qualitative intervention approach to entrepreneurial marketing strategy in craft-based enterprises in emerging markets. Journal of Research in Marketing and Entrepreneurship, 26(5).
- Hensel, K., & Deis, M. H. (2010). Leveraging social media to boost marketing and advertise more. Journal of Entrepreneurship; Arden vol.15, 87-97.
- Juyal, A. N., & Juyal, S. A. (2022). Entrepreneurial success through creative marketing. Academy of Marketing Studies Journal, 26(2), 1–9.
- Lam, W., Yang, S., & Harris, P. (2019). Understanding U.K. ethnic minority business from an enterprise culture viewpoint. Journal of Public Affairs, 19(4), e1922.
- Leisch, P., Weerawardena, J., & Sullivan Mort, G. M. (2012). Evidence from both global firms advancing entrepreneurial marketing. European Journal of Marketing, 46(¾), 542–561.
- Novitaningtyas, I., Verawati, D. M., & Achsa, A. (2023). Application of marketing strategies innovation and business model development: Study of SMEs in tourism hamlet. Airlangga Journal of Innovation Management, 4(2), 172–184.
- Sousa, J. C., Nobrega, K., Costa, W., & Felix Junior, L. A. (2020). Innovative strategies and entrepreneurial strategies.

EFFECTS OF RUSSIA UKRAINE WAR ON GLOBAL ECONOMY AND ITS FINANCIAL IMPACTS

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Abstract

The war has impacted different parts of the economy from the energy markets to sanctions to geopolitics. In total all these parts have had collective implications for the world's economy which has slowed the recovery of the world's economy after the covid phase. The effects that require to be severely looked upon is the contraction of Ukraine's economy which has sent its economy back from where it seems difficult to recover, Europe's economy is also not in very good condition where the growth rate is almost close to nil, the inflationary pressure which is the result of implicit disruption in the commodity markets which are considered for running of the various business houses in the world and the shock to financial market is also a big blow and has caused high amount of losses. The impacts of such war involve a gamut of ramifications which are in certain ways good to some economies and bad to some, but in total the war has never resulted in the development and collective growth of all economies. A Significant thing that has been hurt in the belligerent situations is the loss of globalization, which is an integration of various economies but this term doesn't seem to give meaning as the war has divided the world into two parts where the countries are looking at whether they should trade with a certain country or not, striving to maintain their diplomatic relations whereas the economies must look on the ways to boost themselves rather than involving in a definite argument.

Introduction

A Country with the Largest Landmass on the planet, a republic with its existence spanning two world's major continents: Asia and Europe, an economy that is a significant energy and grain producer and an exporter tied with major consumers of the world, what happens when it invades another country which holds an imperative place in the Europe's economy. These lines make it implicit that it is none other than RUSSIA & and UKRAINE. The World's Economy was already deeply scarred by the Global pandemic, and then the war started which caused a further impediment in the recovery of the economies trying to get back on track. The War started on 24th February'22 with the escalation of the Russo-Ukrainian war of 2014 and the global economic leaders were not too late to impose sanctions on Russia to stop the War, the decisions of these leaders were not only going to affect Russia, but these sanctions created a huge trouble to the imposers too. The Russian Banks were removed from the major financial banking system called SWIFT which inhibited the payment collection of their energy supplies from different countries, Germany stopped the opening of the NORD 2 gas pipeline **(Guardian, 2022)** which not only affected the economy of Russia, but the imposers also suffered the effects. Russia holds a major amount of share in the world's economy and is a supplier of a plethora of resources to the world consumer, it is to be understood that it can't be cut off from the world's economy and several countries trying to do that just put the economy of the world in the disruption. Moreover, the war is the reason for the soaring inflation, Russia with almost close to 2700 sanctions and with $300 billion frozen **(Reuters, 2022)** in the gold and foreign reserves where the US and the allies embargoed oil the prices of oil recorded one of the highest points in the history of dealing with Russia. A War is never only a cause of a social outcry but economic trouble to not only the promoter of it but also all the related countries to it. Due to this, economies like the United States are on the brink of recession, The stock market already had a rough time in 2022, the investors seem to fear a recession in the coming one to two years. The US Tech Giants are already wary of the recession, and they are laying off a huge chunk of employees which would be impacting the large number of employees connected to such companies spread all over the world. Even if the war comes to an end the effects of it would be lasting for a long period of time making overall global economic growth slower. The Impacts could be sensed when in June'23 the US Federal Bank increased its repo rate from 5.25 to 5.50% by 0.25 bps (**Bloomberg, 2023)** which made it the highest level since 2001. The increase in the repo rate was witnessed by many other countries like India, the United Kingdom, etc

Literature Review

A Conflict between two major European powers, one of which is one of the world's biggest superpowers in the modern era would in any situation instigate dire results over the different components of the economy substantially the financial markets, Commodity markets, etc. This Problem has not been deeply studied by many though there are some papers available that analyse the different aspects of it, being a large significant happening in the 21st Century one must dig deeper into the conflict to draw out the major effects that have spewed out in last 1-2 years and how a war in the modern era is not only restricted to military damages but extend to affecting the interlinked globalized economy. An Important term that would recur again and again in this topic is "Economic Sanctions", which in simple words is a restriction created by one country on another to trade or deal with them or a group of countries of specific commodity or service to ultimately force them to act in the way they want.

Research by **Ruth & Divine (2022)**, Assesses the implications of the war on all major economies: the US, UK, and Canada. Rationally the Russian economy must have crippled but in reality all these in a way backlashed at these countries, There is a use of Social Contract and interest theories to find these implications over them. Recommends the policymakers to find an alternative means to find a better substitute of what Russia was to them. Quotes 70% of world's neon export is done by Russia is used in semiconductors and is a major commodity exporter. Hence, a alternative is near to impossible. Social contract theory focuses on securing lives of their citizen but interest steps on it. A Research by **Gans Morse (2022)**, indicates the abolition of Russian involvement in the SWIFT Transactions systems, boycotting and embargoing trade of Russian oil. A Further also shows also occupying and freezing assets of oligarchs of Russia. A Research **Raghavan (2023)** by Moreover, studies put out that sanctions mostly stayed misdirected which led to more alliances between Russia and China, and other countries boosting its trade. While **Bown (2022)** argues that there exists opposite view also, studies opposing effects in western countries increasing its problems and inflationary pressure

Research by **Ebru (2022)**, Studies the damaged geopolitical relationship between Russia and all Western Countries which has deeply injured and slowed down the global growth rate, financial markets as well as commodity markets. It uses reports from different renowned organizations such as the World Trade Organisation, World Bank, etc. Recommends three channels of solutions that are working on the financial sanctions, controlling inflation of the commodities, and resolving the disruption in the supply chain. Slowed down the growth rate of economy by 1%. One more research by **Centre for European reform (2023),** indicates that Europe is looking for an alternative energy source to cater the need that was earlier fulfilled by and the transfer is now accelerated and want to see a dwindled use of Russian dependence in future. If we consider the prices spiking which has been up to $20 a barrel though **Thomson(2023),** though spikes have been stabilised as middle east and united states have catered such needs which is also a strong economic decision by United States which has benefitted them significantly.

Research by **Zaghum (2022)**, Digs deeper into the effects of the war on the mainly financial markets and commodity markets. The effects divided into short-term and long-term are studied and how it made the market highly volatile. The research goes into the statistical part unveiling the dynamics of connectedness and net time-varying. Dynamics of connectedness studies how one commodity affects the inflation of others. Also, **Brooking Institutions (2022),** is a study which indicates that the already the economy was damaged by Covid further war has destroyed the supply chain effecting the commodity, for instance Ukraine served a majority of grains and led to food issues in Europe.

Research by **Nawar (2023)**, studies how the war has affected the local consumer by increasing inflation due to the disruption In the supply chain. The sanctions were highest on the financial sector followed by oil services which are major needs of normal economic growth. The major stock markets such as NASDAQ fell by almost 16.7% and Dow jones by almost 8% compared to end of 2021. Suggests to work on political relations to improve the condition of economy. Also **Fang (2022),** made investors behavioural moved significantly and deepened volatility. Further According to **Bloomberg (2023),** shows interest rates rise by federal bank which was in reference to the increase in inflation and broken supply chain such move was also followed by the European banks. Nonetheless, the war future delayed settlement increase uncertainty of market. **Hartenstein (2023).**

A Different Research Area that has been explored by research of cyber world is intriguing, **Buchanan 2022,** at the same time with the physical war attacks, the banking systems suffered several cyber attacks in situation where many temporarily breakdowns of servers. This Risk taking such considerations also. Another Trending topics in today's market involves Environmental Social Governance Impact, by **Varghese (2023),** the removal of dependence over Russia has also accelerated the move of European move towards alternative source these sources are not just motivated by using a different exporter of oil also, shifting the use of conventional resources to non-renewable resources which is also a great move towards benefit of overall environmental area though intentions behind it may be misdirected.

Objective

The objectives of the research paper involve the study of different components that form the whole economy and the origin of conflict to understand it better. "**Main objective is to study the impacts of the war and its financial repercussions of Russia-Ukraine war on different markets including Energy, Commodity, Financial Markets etc."**

Focused areas highlights the success of sanctions, disturbed supply chains in – commodity-financial and energy markets, positioning of alliances and geopolitical and also study of long and short term impacts.

Inclusions

Historical Context has been studied to deeply trace the a brief understanding of the background of the conflict and the events such as the annexation of Crimea that resulted in the war is necessary, this study focuses on giving a part knowledge of it. , **Economic Overview and Immediate Economic Effects** included to the conditions of the economies and geopolitical relations with different countries before the conflict is of high importance to know its aftereffects and at the same time immediate effects are also studied in the research, **Energy Markets** are the powering house of all the sectors is the energy market, and disruption in it can create a great problem in the supply chain and such effects are studied in the research. Moreover, **Global Commodity Market** gives Commodities such as fertilizers, oil, etc are major contributors to any economic growth, and when war hits it even the smallest stakeholders are affected and such ramifications are of great significance in this study. **Financial Markets** makes it a gamut of markets such as stock, currency, and bond markets. The downfall in it has changed international investor decisions majorly and is studied here. Importantly **Sanctions** Sanctions include all the restrictions made by one country on another of trade and service to get what they want. This study focuses on the effects of the sanctions on crippling the Russian economy. Further, **Global Supply Chain** forms the globalized economy which is interconnected with each other is deeply crippled by such wars and the implications of it are studied in the research. At last **Geopolitical Implications** makes the alliances, and the stance of different nations mould the global trade in this modern era and findings have been made available in the study.

Research Methodology

Research Design is a framework, that maps out how study on a topic is outlined in order to achieve the required objectives. It outlines the methods, procedures to collect and analyse such information. The Research Design this study on effects of Russia-Ukraine War on Global Economy adopts is **Descriptive- Exploratory Design.** Such Design is a mix of both descriptive and Exploratory, such intends to provide proper description about the problem as well as knowing how such problem came into existence and exploring insights about such. Mainly Focusing over “What and Why” of the Whole Problem. In such Study, such method has been instrumental because this provides description about trends of macro factors and cause-effect of the problem. The Research type involved in the study is **Qualitative Method** which involves qualitative, which involved analysis of trends, policies, sanctions and using thematic codes to show the results by referring to codes selective from study.

The Selection of Sample as subset from Population has been done from **Purposive Sampling** (Non probability sampling), because sample has been selected on a particular purpose and criteria. Here, the specific criteria are “**Sectors and Regions”**. Sectors focused are energy, financial and commodity markets while Regions basically focused Russia, Ukraine, Europe and influence of USA. Time Frame that has been put is from 2014 to 2023 focusing mainly on post war impact after 2022.

Data Collection method and tools is based on **secondary data** that is basically based on reliable sources published by important organisation of world such as world trade organisation, and famous journals such as finance letters research, and renowned news outlets such as Reuters, Bloomberg etc. The Analysis done on research paper is **Thematic**, paper uses different dimensions focusing on different elements of economy. Different themes were used such as economic disruptions, volatility in market etc. providing findings which were multifaceted on economy on different parts of economy. All themes have provided a interconnected and interdependent nature having a cause and effect relationship between sources.

Research Results and Findings

The Findings are based on **thematic analysis** done on research paper, analysis done is on qualitative date based upon their themes and findings have been gathered. Thematic analysis is a type of analysis which involves knowing patterns and relationships within data without having to rely upon on some quantitative analysis. This kind of analysis is able to comprehend underlying things behind them. This Paper involves different dimensions such as sanctions, energy markets, financial markets etc. Issues such as inflation, implications of policy and disruptions.

For such analysis different codes are generated and with such analysis we put these codes into broad themes

THEMES	RELATED CODES
ECONOMIC CHANGES	"Trade Sanctions over Russia" "Blocked Supply Chains" "Economic Slowdown and Increased Inflation"
ENERGY TURMOIL	"Disruption in Energy Markets" "Implication on Global trading"
FINANCIAL MARKET VOLATILTY	"Investors responding to Market Changes" "Volatile Financial markets"
GEOPOLITICAL RELATIONSHIPS	"Alliances and shifts In policies" "Changes in Diplomacy due to Sanctions"

The Findings have gathered according to each theme and provided below: **-**

1). **Economic Changes:** The war has resulted in significant impact over the economy globally, specifically in supply chains and inflationary pressures.

Evidence: (i) The exports done by Ukraine have dropped by almost 90% due to blockages of ports by Russia, that has caused a food shortage, increasing inflationary pressures. **(Ukrinform, 2022)**

(ii). The Sanctions by Western Countries on Russia, has changed European markets causing higher energy prices and reduced trades between Russia and Europe. **(Central Eurasia Studies ,2023)**

2. **Energy Turmoil:** The War has caused the energy markets to be volatile and there is change in dependency of countries on each other.

Evidence: (i). The Construction of NORD Stream 2 pipeline has been suspended which were to cater millions of people in Europe (Germany), reduced exports to Europe and there is a major shift in type of energy used in Europe. **(Webb. S, 2023)**

(ii). As a immediate effect, energy prices was increased by more than $20 a barrel which is a remarkable evidence. **(Hume.N,2022)**

3). Financial Market Volatility: The Financial Markets have experienced a instability due to war, but has stabled now.

Evidence: NASDAQ And Dow Jones experienced a drop following the war which was 16.7% and 8% respectively **(Nawar,2023)**

(ii) The Market became much uncertain due to tensions between countries and volatility in market.

4). Geopolitical Relationships: The War has changed the scenario, which has effected alliances and partnerships of trading.

Evidence: (i) There was increased trade between major Asian countries like India, China with Russia while Turkiye had a neutral stance over this. **(Guldogan.D,2023)**

(ii). This Conflict has increased US-Europe alliances while with India there has been no change of alliances even after aligning with Russian Powers. **(Gera.Vanessa,2023).**

The Key Observations which could be found are: -

1). The War has impacted overall inflationary pressures and globalised trade between countries.

2). Sanctions impacted both the country on which sanction were imposed as well as countries who have put those.

3). There is a inevitable need of alternative modes of fuels and strategies especially Europe.

Limitations and Research Future Direction

Some Limitations that we think this research has are:-

1) **Dependence on Secondary Data:** This Study is solely dependent on the secondary data such as Journal, reports etc which influences it quality on reliability of those databases.
2) **Focusing on Bigger Economies:** This Study has analysed impacts on major economies however there are chances of smaller economies of being overlooked. It may not present the lesser prominent economies.
3) **Lack of Quantitative Analysis:** This Study has solely analysed data on basis of thematic analysis, though statistical data has been provided through references however predictive models cannot be shown through this.

Future Directions

1). Quantitative Analysis Integrations: In Future a Quantitative Analysis can be added to such research, by incorporating more statistical methods such as predictive model.

2). Long Term Study: A long Term study can be initiated in order to see how Ukraine and other countries are able to mend the changes caused by the war.

3). Future Diplomatically Positions: This one can study how a future would go with these relationships between the countries, all the geopolitical directions can be taken into considerations.

Historical Context

Though the war officially started in the year 2022, the relations between Russia and Ukraine have been strained since the collapse of the Soviet Union in the Year 1991. Ukraine has always been politically, militarily, and economically important to Russia. Ukraine was called the Breadbasket of the Soviet Union which shows how important the country is to Russia. The Region of Ukraine has always been a conflicting geopolitical place that holds some of the major events in history and also shows us how the disputes that are arising today have their roots in history. If we were to know the history the region has always been in jeopardy which dates back to a millennium, though the boundaries of independent Ukraine came into existence in the 20th century, history has a lot to tell us about the whole scenario. Each of the events must be deeply understood chronologically to have an idea of the reasons for the war's occurrence in the present time. The Events which have occurred from the 10th century to the present are as follows: -

- **10th Century-** The region which is called Ukraine today was known as the Kyivan Rus state. The Norse People used to sail from the Baltic Sea to the black sea and were majorly Swedish in origin, attacked the Byzantine Empire and Persian Empire and these traders settled around Kiev and people started to recognize them as Rus People which meant People who row in the sea. (These people are ancestors of those now we call Russian, Belarusian, and Ukrainian).
- **12th century-** The people started calling Kiev as the "Mother of Rus cities" and gained a dominant place in the empires which attracted other empires to attack it thus Mongolian horde reached the Rus state and conquered it. It was during this period the Grand Duchy of Moscow came into existence (Which is now the capital of Russia).
- **16th Century-** Between the 12th and 16th centuries many different empires ruled upon the Rus State like Polish and Lithuanian communities. In the 16th century, a community called Cossacks started to protest and resist against the Polish Lithuanian control and wanted to join the Moscow empire. Eventually, a treaty was signed between them and Tsar Alexis of the Romanov dynasty. (Later the Soviet Union used this to reunify the different Rus People together).
- **19th Century-** During this century, the Ukrainian identity started emerging. By this time Russian People started calling Ukrainian supporters the Little Russians. The People demanding an independent Ukraine lasted for almost 100 years but the Russian empire was quite strong enough to break the sovereign state of Russia.
- **20th century-** In 1917, due to the Russian Revolution Ukraine was an independent state for a very short period of time but soon became part of the USSR (Union of Soviet Socialist Republics), Russia and Ukraine were founding signatories and with its fertile plain was of great use to Russia. Between the period of 1922-1991, Ukraine faced a lot of atrocities due to the rule of Stalin's government induced state-sponsored starvation of the country (genocide) by selling the Ukraine produced grains overseas to earn more profits and also due to World War 2 the period witnessed killing of more than 5 million people of Ukraine. In 1991, The USSR formally collapsed, and Ukraine came into existence as an independent state. The Elections happened and Leonid Kravchuk was elected as the first president of Ukraine. With the independence of Ukraine, It became the third-largest nuclear power though these powers were taken away by mutual consent between the Russia and West, and The 1994 Budapest Referendum.
- **21st Century (Present times) –** In 2014, Great unrest was present in the country, people were protesting the president's refusal to sign the document with the European Union for free trade. In the Same Year, Pro-Russian started an uprising in eastern Ukraine (Donbas Region) which was later suspected to be Russia-sponsored and these separatists started proclaiming

the Donetsk and Luhansk. Crimea was annexed by Russia which was not recognised by the international community and allowed Russia to have a strategic and militarily strong position as it has ports accessing towards black sea. In 2019, A change in the constitution of Ukraine enshrined a closer bond of the country towards NATO and the European union Increasing the fears of Russia about the influence of Western powers on the borders of Russia. At the beginning of 2021, Russia was creating a large presence of Russian armies at the borders and after the world just crawled from the covid 19, Russia started its invasion on 24th February 2022.

Key Events leading to the war

- **Euromaidan Protests-** In early 2014, the Euromaidan protest broke out which led to the outbreak of pro-Russian support in eastern Ukraine. Russia took the authority over government assets and buildings present in the region. Eventually, in March, a contended referendum was passed in the Russian parliament which resulted in annexation of the Crimea, and just after a while the regions of Donetsk and Luhansk started to face a rise in the Separatists who suspiciously received covert support from Russia.
- **Frozen conflict till the year 2021-** A continued conflict at these regions and borders resulted in the signing of the Minsk-II Agreement which made it a frozen but never fully settled conflict.
- **Beginning of 2021-** In 2021, Russia started to create a large military presence at the borders of Russia-Ukraine and President Putin came to light accusing the Republic of Ukraine of exploiting the rights of Russian speakers and collaborating with Germans to support neo nazis.
- **The war in its full-fledged phase-** On Feb 24th, Putin ordered the deployment of military forces to take control of newly recognized states by Russia which was referred to as the act of 'peacekeeping' by the country. In response, the Ukrainian Government implemented a 30-day emergency, and soon after the clear intentions of Russia, a martial law was passed restricting all the male (18-60) Years old from leaving the country. The World Expected it to be a short Russian victorious affair but eventually, the modern nature of the combat is still leading the war.

The Annexation of Crimea and its significance

The Annexation of Crimea is the instigation point of the whole Russia-Ukraine Conflict. The Contentious issue is the result of the referendum that annexed Crimea though not recognised by the international community. The major question is why Crimea is such a significant part to be fought upon and to bring such belligerent situations. The Crimean Region is crucial for both the countries. The Geographical Dominance in the Black Sea makes it significant for both the countries to put their flag on. Such issues and Ukraine's increasing closeness to the European unions and Allies ramified the situation of the war.

Economic Overview of Russia and Ukraine

To have an overview of the economic conditions of Russia and Ukraine we need to study the pre-war economic conditions of both countries. If a period of a few years back is to be scrutinized the Russian economy was growing at the rate of 4.3 percent in the Year 2021 which is a good number as of being an ongoing pandemic growth. The Inflation was on the rise for sure as Russia went through high demand and supply bottlenecks. The Central Bank of Russia began its tightening policy in 2021 with the aim of controlling it. The Country stood as the 11th largest economy in the world and 2nd largest in Europe after Germany. This is to be brought to light that Russian exports to Europe of the oil and fuel requirements were the largest in the year 2021 before the countries embargoed. The Russian Sovereign acted as a huge supplier of Energy and fuel to the whole of Europe. On the other hand, the Russian Enemy Country Ukraine has been in a troubling economy almost from its independence. In the Year 2014, the country faced a recession by losing its largest trading partner after the annexation of Crimea, the economy shrank by almost 6.8%. Having a more retrospective view, the year 2008-09 was also an economic imperfect year due to the great recession of the country and the reason is suspected to be a high dependence on Russia and inner banking problems. Ukraine definitely can be called an underachiever since the economy never realized its potential and is considered an old man of Europe, the country could not be seen stepping outside its soviet umbrella over these years though it could have become a breadbasket for the world rather than just being a declining a economy. A fact that depicts the condition of the inner state of the economy is that it was ranked 2nd most corrupt country in the world. The Interdependencies of the countries have been intricate for centuries, a hefty portion of more than 60% of Ukrainian exports went to the Russia and Former Soviet Republic while the main import partners were also the former Soviet republics. On the Contrary, Russia did not seem to be solely dependent on the neighboring republics in fact it imported goods worth $72.6 Billion from China and Germany was also a major exporter to the Russian Republic. From this, it could be clearly concluded the huge dependence of Ukraine on Russia might be the reason for not being able to realize its potential though before the war Ukraine was in striving to maintain good relations with the European Union which could have boosted their economy, but things went head over heels.

Immediate Economic Effects

The war has affected both countries though the effect on one can be significantly more than the other but seeing Ukraine as the only sufferer would be wrong. The war is costing Russia almost half a billion a day which is a huge cost that would be difficult for the country to recover in the next few years. The economy was able to defy the expected contraction benefiting from the trade diversion but getting back to its original state remains a long way as the government continues to direct more funds towards the war. The Country's growth is hampered due to the loss of connection with the globe, loss of human capital, and the leaving of multinationals. A constant battle of keeping its budget deficit is challenging, as the spending on the military soars and sanctions tighten the neck and make it difficult to trade. The most oligarchs have been sanctioned who make up a huge part of the Russian economy which makes it hard to run its economy in full. The sanctions revolved around the energy trade and financial markets, The European Union stopped importing coal from Russia, Germany stopped opening Nord Stream II, and Russian banks were removed from the Swift creating an interruption in receiving payment for its gas. At the same time, many sanctions also acted unaffected in freezing any trade with Russia. Whilst Ukraine has been deeply scarred for years, the resilience of such can take years. Ukraine exports dropped by 90% because of blocked seaports leaving Ukraine standstill. Most exports were done to Russia by country which went into oblivion after an obvious invasion by the country, the overdependence has led the country's business to the ashes. Ukraine was catering huge grain and sunflower oil needs to Europe which is troubled now due to the blockage of black seaports and is able to export small amounts by the Danube and western land borders. The exports by Ukraine have almost reduced to half of what it was last year. The conditions of economic restrictions would take a long time to get back to their original state and relations can take years to get to normal, we can say Russia has found different ways of overcoming its sanctions but still the huge country has affected other parts of the world too.

Energy Markets

One of the crucial markets that is significant and essential in boosting of an economy are the energy markets which cater the needs of the different other sectors such as powering houses, manufacturing good, logistics etc. With the disturbance and turbulence in such sector can put the whole system of growth of an economy to trouble. Russia being the third largest oil producer, the traditionally second largest natural gas exporter and the holder of largest gas reserves make it a focal point for the global energy market. It must be put to the attention that Russia helps in sustaining a huge part of energy needs of Europe which has been a centre of trade and commerce for centuries and a nucleus of the energy demands. After the western world condemning and not recognising the invasion of Russia in Ukraine a constant effort of cutting the supply of Russia have been enforced. Such tenacity of western world of efforts to buy energy cheap with embargoing the trade with Russia has put the whole energy market to a big risk. In the 2021, the Russia produced 762 bcm of natural gas and was able to export only 210 bcm through pipeline which projects the downfall of the energy market which has been caused. At the starting the energy supplies continued to flow to the whole Europe but In late June the changes started, though at first the Russia was reluctant in supplying to countries such as Finland who were moving towards NATO Membership and denied supplies to Poland and Bulgaria due to increased western influence. One of the most major event that occurred was the suspension of the Nord Stream 2 which was supposed to give direct flow to the Germany and was invested largely by a Russian state owned company Gazprom. This Stream was expected to cater 26 million European households and was expected to double the flow to Germany. The world hoped the delay would be temporary but the constructed pipeline has been halted for almost two years now. The Nord stream expected to lower the prices of gas, though after the freezing of project the prices have been soaring high due to the several leakage in the Nord stream 1. Moreover, the European commission has been planning to reduce its reliance on the Russian energy imports and aims to make the whole Europe independent from the fossil fuels of Russia by 2030. It would include diversification of the importers, increasing storage levels, developing a crisis framework and much more which would eventually be effecting Russia badly in the coming few years. Other countries such as UK and USA also sanctioned against Russia and are striving away from their reliance , however they recognised the needs in the short term. From the perspective of energy, many country see the energy transition for the reduction of reliance over such countries. From the very start the market reaction was strong and deep the prices of barrel jumped over $20-25 dollars which were huge. In conclusion one thing that can be made clear is that a rift has been created between Russia and the west and a constant volatility in the market can be expected in coming time, some countries continue to be a traditional importer of oil and gas from Russia such as India, China etc. Both the west and Russia strive to find the solution of such but in practice a volatile soaring market putting all economies to trouble is evident.

Global Commodity Market

The Ramifications of the Russia-Ukraine war have hit the global commodity too. The Global Commodity Market has suffered one of the major shocks in the Year 2022 but has also shown resilience in the Year 2023. Russia and Ukraine account for key exporters of grains, fertilizers, and energy. The war has exacerbated the already disturbed market by the effects of the pandemic and the effects have continued aftermath of the war. The effects on the global market can be traced by two reasons: One being the destruction of the production capacity of nations and the other being the sanctions by the West on Russia. Considering the fact that Russia-Ukraine collectively form one-quarter of global wheat exports any disruption between the two countries can disturb the market for some period of time before returning back to its prewar phase. History has given us different episodes which have caused an increase in the price of oil and food like in the 1970s and 2000s which were due to stress in Ukraine and can shed light on the importance of the mentioned countries in the commodity markets. Ukraine is losing almost 3.2bln of exports in 2023 due to the war which is because of the high cost of logistics, fuel, and price disruption in the fertilizer markets. The major concern that arose with the war is the food security concern, which is such that the UN warned that the biggest food crisis since World War 2 could come into play. The Major reasons can be:-

- Russia targeting the agricultural sector of Ukraine.
- Blockage of ports by Russia at the Black Sea
- The blockage of exports can cause starvation to millions of people
- Sunflower oil has been affected severely with a 40% rise

The Estimates forecast an increase in the number of undernourished people on a major scale, which is a serious concern for the whole world.

Financial Markets

A market that reacts to its environment most is the Financial Market. Such changes in this reactive and sensitive market are obvious in the belligerent situations between the two major powers of the world. Due to this an apparent disturbance and discompose has been caused and has enthralled all major investors and stakeholders in such markets. This severe turmoil is related to the fears of recession, increased changes in the agricultural market, sudden inflation, and a fall in the value of the euro. The recession fears in major economies like the UK, Singapore, and the USA is related to the sudden swooped levels of the GDP Growth rates, the energy crisis, Food Shortages, and slow-steady economic growth. During this period there has been a decrease of 0.52% in returns for every 1% increase. The critical food and energy markets are significant reasons behind the unprecedented fall in the value of the euro which is almost 4% fall against the dollar. Not only the euro many European currencies are evidence of such a fall which has caused different things. The European equities markets have been critical due to the proximity and connectivity with these countries, some repercussions are related to the sudden exodus of Russian companies. The Bonds Market has suffered where cost has ballooned and the worries have definitely deepened. Such surged inflation has increased Europe’s interest rates. Such Geopolitical issues have inevitably contributed to shaping the financial markets though the investors have reacted in a moderate manner not in a panicking manner even after a major disturbance in the other markets during the first post-quarter year of the war. However, a consideration of major falls in the different stock markets of different economies is noticeable and has had a significant impact.

Sanctions and Economic Warfare

Economic Sanctions are related to the coercion that is attempted to get an actor to behave in the right manner by the creation of an economic barrier in the usual trade. Since, the invasion of Russia into the Ukrainian state which was unrecognized and condemned by the numerous Western countries and unions of these countries, a number of countries decided to move against this act of Russia and started imposing different sanctions on Russia in order to control and surround the country economically. The US, Canada, and the European Union had already invoked some of the sanctions during the annexation of the Crimean region, though collectively the sanctions by the different Western allies have just been imposed after the invasion of the year 2022. This time the sanctions have been taken by different countries who had not taken part previously like South Korea and a Non un-member state Taiwan. These sanctions have targeted different sectors such as banking, aviation, defense, energy, aerospace, etc. One of the major sanctions that came out on 12th March '22 is the removal of Russia from the SWIFT Financial System that came out after the mutual decision of the USA and its allies countries like Canada, United Kingdom, France, Germany, etc. Russia has been highly reliant on this financial messaging system for the collection of payments for their oil and other exports and removing Russia from this payment system it created an impediment in receiving the payments and eventually reduced its foreign reserves of Russia to some extent however Russia has tried to use various alternative system in order to overcome this. The sanctions have banned billions of exports to Russia and imports from Russia which have had a prominent effect on its economy. The other sanctions include:-

- Freezing of the Russian assets in the banks.
- Restricting Russian Firms from borrowing funds.
- Travel restrictions on different Russian influential people
- Banning on imports of diamonds
- Russian gas and oil imports banned by US & UK
- Stopping the Nord stream 2 gas pipeline

The question that arises is that have the sanctions really worked ?, in the answer it, that the success of these sanctions in restricting Russia from stopping its invasion process has been quite slim however there has been definite damage to the economy of Russia which has resulted in hindrance in its production, a budget deficit, difficultly replacement of military equipment, lost imports and loss in the foreign direct investments in the country. The country has constantly accelerated in maintaining a good rapport with other countries to fulfil and run its economy through good diplomacy though its already ruined relations with Western countries are difficult to get back to where they were in the prewar situation. The fact that is of high significance is that the sanctions have not only put the Russian economy in trouble, but these sanctions usually have dual effects which have implicated sheer damage to the world's economy too which could have been in a much better state in a nonwar peace scenario.

Geopolitical Implications

The Geopolitical issues are related to the impacts of changes in geography and economies on relations between the countries. The Russia-Ukraine war has had similar kind of implications for the relations of different countries with these war-affected regions. The war has upended the world order and relations with each other and has created various new blocs. The war has had a definite effect on the relations and has loosened the grip of Russia on the Central Asian republics and opened a new space for Türkiye Whilst many philosophers believe the war will certainly leave Russia and Europe weakened and make Europe more dependent on the United States. The major country's reactions are noted down: -

- **Middle East-** The reaction of the Middle East on the matter has been balanced and they have tried to treat both the US and Russia neutrally, some rejections of USA Offers have also been seen.
- **Arab Countries-** The reaction of most Middle Eastern has been neutral despite Russia's invasion although two of the countries which are UAE and Saudi Arabia have been under pressure from the West to join the League of Sanctions However, they have tried to make a certain balance.

- **Türkiye-** Türkiye stemming its national interests has opted for a balanced reaction, being a NATO member, it did not blindly go with the West's interests but also contradicted the joining of Finland and Sweden in NATO and required the West to act on the Kurdish problems.
- **Iran-** Iran has been demanding a consensus on Iran's nuclear agreement but the war has negatively affected its strive to achieve it as it is also one of the countries which has been victim of sanctions.
- Countries like Israel, India, etc have used a very neutral way of maintaining the relations and have avoided direct criticism of the Russian parts although the loss of human life is always condemned.

These types of war always have a certain effect on the relations between the countries and ramifications can lead to a huge loss of diplomatic relationships between the countries which can be considered a great loss.

Conclusion

The war has impacted different parts of the economy from the energy markets to sanctions to geopolitics. In total all these parts have had collective implications for the world's economy which has slowed the recovery of the world's economy after the covid phase. The major result that requires to be severely looked upon is the contraction of Ukraine's economy which has sent its economy back from where it seems difficult to recover, Europe's economy is also not in very good condition where the growth rate is almost close to nil, the inflationary pressure which is the result of implicit disruption in the commodity markets which are considered for running of the various business houses in the world and the shock to financial market is also a big blow and has caused high amount of losses. The impacts of such war involve a gamut of ramifications which are in certain ways good to some economies and bad to some, but in total the war has never resulted in the development and collective growth of all economies. A Significant thing that has been hurt in the belligerent situations is the loss of globalization, which is basically an integration of various economies but this term doesn't seem to give meaning as the war has divided the world into two parts where the countries are looking whether they should trade with a certain country or not, striving to maintain their diplomatic relations whereas the economies must look on the ways to boost themselves rather than involving in a definite argument. In conclusion, the war has degraded the economies of both countries which are a significant part of the globe but at the same point it can be taken from it that a certain loss of human lives, and trouble to the economy has caused a possible recession, loss of jobs and hurting to the daily lives of people have been caused and some of the particulars industries are milking their profits from the war which is of no good to the people in whole. Such wars must be avoided if the world doesn't want to disrupt the growth of everyone.

Recommendation

1). To the Government- The Governments of both countries involved in the belligerent conditions must look upon resolving the conflict as it is not only affecting these countries economically, militarily, and geopolitically but it is a matter that is going to harm the whole world's economy and relations between countries that long back to decades and centuries.

2). To the International organizations- International organizations like World Trade Organisations must perform their basic objective of facilitating free trade and promotion of globalization all over the world. Even if there is conflict between countries, trade must not be affected as it focuses on the overall shared prosperity of the world.

3) To the Businesses- Businesses generally act in a way that focuses on maintaining relations with the ruling governments, such business houses should act in a balanced way since in today's world these businesses have their presence worldwide and they should be conscious of the facts that their actions should not only act in order to satisfy their respective governments but all towards the innocent general public who have been their consumers for a longer period of time.

4). To the People- After all the apex bodies are conscious of their responsibilities, one responsibility of the general public is to eradicate hatred and promote a peaceful relationship between people living in different countries since a perception of seeing the whole world as one would be beneficial for countries of all people. They can look at it by going through one of the Indian concepts which is “Vasudev Kutumbakam.

References

- .History Hit. (n.d.). History hit. https://www.historyhit.com/
- Reuters. (2022, March 13). Sanctions have frozen around $300 billion of Russian reserves. The Financial Express. https://www.financialexpress.com/world-news/sanctions-have-frozen-around-300-billion-of-russian-reserves/2459552/
- Bloomberg(2023). Fed Cuts key by 0.25%. Business Standard. https://www.business-standard.com/economy/news/fed-cuts-key-interest-rates-by-0-25-reverse-repo-rate-lowered-to-4-25-124121900028_1.html
- Ukrinform (2023). Ukraine not being able to export $90mn of trade due to blockage of trade. Ukrininform. https://www.ukrinform.net/rubric-economy/3478674-ukraine-cannot-export-about-90m-tonnes-of-agricultural-products-due-to-blocking-of-ports-shmyhal.html
- Central Eurasia Studies (2023). European Union Energy sanctions against Russian federation.ResearchGate. https://www.researchgate.net/publication/384324696_European_Union_Energy_Sanctions_against_Russian_Federation_and_Its_Impact_on_their_Trade_System_2022-2024
- Webb.S (2023). Halting Russia’s Nord Stream. Independent UK. https://www.independent.co.uk/climate-change/news/russia-ukraine-war-nord-stream-2-energy-b2027698.
- Hume.N(2022). Europeans gas prices soar and oil tops $105. Financial Times. https://www.ft.com/content/c6303127-5edf-4256-9c25-effa75766002
- Dow Jones Falls 464 points to lowest close of 2022. UPI.Com. https://www.upi.com/Top_News/US/2022/02/23/Dow-falls-464-points-lowest-close-2022-Russia-Ukraine-tensions/7361645649957/?.
- Gera.V (2023). NATO Chief appeals for unity as Europe builds. AP.com. https://apnews.com/article/poland-nato-rutte-russia-ukraine-49fa0ce0763926f3c57f6783457ec0e6
- Raghavan 2023. India Russia Strategic partnership. https://scholar.google.com/citations?view_op=view_citation&hl=en&user=2DA0Nk8AAAAJ&citation_for_view=2DA0Nk8AAAAJ:_bU50VfleQC

- Bown (2022). Impact of sanctions on global trade. https://www.brookings.edu/articles/the-impact-of-sanctions-on-global-trade/
- Jones.M (2023). Financial Markets Rattled. Reuters. https://www.reuters.com/markets/europe/how-ukraine-russia-war-rattled-global-financial-markets-2022-08-24/
- The Guardian. (2023, November 4). Russia-Ukraine war at a glance | World news | The Guardian. https://www.theguardian.com/world/series/russia-ukraine-war-at-a-glance
- War in Ukraine | Global Conflict Tracker. (n.d.). Global Conflict Tracker. https://www.cfr.org/global-conflict-tracker/conflict/conflict-ukraine
- Coghlan, G., & Coghlan, G. (2022, April 25). Two months into the Russia-Ukraine conflict, how are investors reacting? Investment Monitor. https://www.investmentmonitor.ai/ukraine-crisis/two-months-russia-ukraine-conflict-investors-reacting/
- Hirtenstein, A. (2023, February 25). How Russia's invasion of Ukraine changed financial markets. WSJ. https://www.wsj.com/articles/how-russias-invasion-of-ukraine-changed-financial-markets-5a80f469
- Jones, M. (2022, August 24). How the Ukraine-Russia war rattled global financial markets. Reuters. https://www.reuters.com/markets/europe/how-ukraine-russia-war-rattled-global-financial-markets-2022-08-24/
- Polityuk, P. (2023, October 19). Ukraine's grain sector losses could top $3.2 bln in 2023 due to war. Reuters. https://www.reuters.com/markets/commodities/ukraines-grain-sector-losses-could-top-32-bln-2023-due-war-2023-10-19/
- How to mitigate the impact of the war in Ukraine on commodity markets | Brookings. (2022, July 1). Brookings. https://www.brookings.edu/articles/how-to-mitigate-the-impact-of-the-war-in-ukraine-on-commodity-markets/
- Fang, Y., & Shao, Z. (2022). The Russia-Ukraine conflict and volatility risk of commodity markets. Finance Research Letters, 50, 103264. https://doi.org/10.1016/j.frl.2022.103264
- Nagle, J. B. P., & Nagle, J. B. P. (2023, October 2). Commodity prices surge due to the war in Ukraine. World Bank Blogs. https://blogs.worldbank.org/developmenttalk/commodity-prices-surge-due-war-ukraine#:~:text=The%20war%20in%20Ukraine%20has,energy%2C%20fertilizers%2C%20and%20grains.
- Energy and climate challenges will continue in 2023 | Brookings. (2023, March 1). Brookings. https://www.brookings.edu/articles/energy-and-climate-challenges-will-continue-in-2023/#:~:text=Executive%20Summary,continue%20and%20evolve%20in%202023.
- Towards a green transition of the energy sector in Ukraine: Update on the energy damage Assessment, June 2023 - Ukraine. (2023, June 20). ReliefWeb. https://reliefweb.int/report/ukraine/towards-green-transition-energy-sector-ukraine-update-energy-damage-assessment-june-2023

- Thomson, F. (2023, February 20). One year on: Impact of the Ukraine war on global energy prices. Open Access Government. https://www.openaccessgovernment.org/one-year-impact-of-ukraine-war-global-energy-prices-input-output-analysis/152599/
- The impact of the Ukraine war on global energy markets. (n.d.). Centre for European Reform. https://www.cer.eu/insights/impact-ukraine-war-global-energy-markets
- Economics Observatory. (2023, June 30). How has the Russian invasion of Ukraine affected global financial markets? - Economics Observatory. https://www.economicsobservatory.com/how-has-the-russian-invasion-of-ukraine-affected-global-financial-markets
- Russia and Ukraine conflict: Economic implications. (2022, March 9). KPMG. https://kpmg.com/xx/en/home/insights/2022/03/russia-and-ukraine-conflict-chief-economist-team.html
- Sutela, P. (2012, March 9). The Underachiever: Ukraine's economy since 1991. Carnegie Endowment for International Peace. https://carnegieendowment.org/2012/03/09/underachiever-ukraine-s-economy-since-1991-pub-47451
- The Road to Recovery: Ukraine's Economic Challenges and Opportunities | CSIS. (n.d.). https://www.csis.org/blogs/development-dispatch/road-recovery-ukraines-economic-challenges-and-opportunities#:~:text=The%20Ukrainian%20economy%20has%20lost,experienced%20since%20independence%20in%201991.
- World Bank Group. (2023). Russia Economic Report. In World Bank. https://www.worldbank.org/en/country/russia/publication/rer
- Solanko, L. (2023, March 27). A year of war has changed the Russian economy. Bank of Finland Bulletin.

THE EFFECT OF ONLINE SHOPPING ON THE PERFORMANCE OF LOCAL MARKET IN TUGALPUR, GREATER NOIDA

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Abstract

This report examines the impact of online shopping on the performance of local markets in Tugalpur, Greater Noida, focusing on shifting consumer preferences and the challenges faced by traditional retailers. With the rapid growth of e-commerce, purchasing habits have seen a significant transformation driven by the appeal of convenience, wider product variety, and competitive pricing offered by online platforms. Based on a structured survey conducted within the Tugalpur locality, the findings indicate a notable decline in customer visits and overall sales for small and medium-sized local vendors. A large section of consumers has shifted to digital platforms, especially for commonly purchased items such as apparel, electronics, and household goods. Despite this trend, the research also reveals that many consumers are still open to supporting local businesses, provided they can adapt by offering competitive pricing, improved service, and adopting digital tools such as online payment systems and home delivery options.

The report concludes that for local markets to remain sustainable and relevant, there is a pressing need for modernization, strategic adaptation, and proactive engagement with evolving consumer expectations.

Introduction

Online shopping has changed the way people buy products, and its impact on local markets in India is becoming more noticeable every day. With doorstep delivery, discounts, and easy return policies, online platforms have made shopping more convenient, especially for people in semi-urban and rural areas where malls and large showrooms are not easily accessible. Many customers now prefer online shopping because it saves time and offers better prices than local stores.

At the same time, small retailers in local markets are struggling to compete. Just like the shops in Scottish island communities, local businesses in India also face challenges like high transportation costs, limited variety, and the inability to match online discounts. However, these small shops remain an essential part of the community, especially for elderly customers who rely on them for daily needs. Many local stores try to survive by offering personalized services, flexible payment options, and even combining other businesses like running a post office or selling local products.

Despite these efforts, the competition from online retailers continues to grow. Most Indian consumers are price-conscious, and online shopping provides them with heavy discounts and offers that local shops find hard to match. The lack of cooperation among small businesses further weakens their position. If local retailers want to sustain themselves in this digital age, they need to adapt, work together, and find ways to provide something unique that online platforms cannot. This paper explores how online shopping is affecting the local market in India, the challenges faced by small retailers, and possible strategies for their survival.

Literature Review

Growth of Online Shopping and Its Impact on Local Markets

The exponential growth of e-commerce in India has been largely fueled by the convenience and affordability it offers. Platforms such as Amazon, Flipkart, and Meesho have revolutionized how consumers shop by providing an extensive range of products at highly competitive prices.

According to Chatterjee and Kumar (2021), the surge in online shopping has directly contributed to a notable decline in footfall across local retail stores, particularly in urban and semi-urban regions. The ability to quickly compare prices, access reviews, and benefit from discounts has shifted consumer preferences toward digital platforms, as noted by Sivakumar and Gunasekaran (2020). These trends suggest that local businesses must reevaluate their strategies to retain consumer attention and maintain relevance in this fast-changing retail environment.

Consumer Behavior and Preference for Online Shopping

Consumer behavior in India has undergone a significant transformation due to the rising appeal of online shopping. Indian consumers, being highly price-sensitive, are naturally drawn to the frequent discount campaigns, cashback offers, and festive sales commonly hosted on e-commerce platforms (Mishra & Malhotra, 2019). In addition to cost savings, the convenience of having products delivered directly to one’s doorstep, along with flexible return policies, has played a crucial role in attracting a wide customer base, especially younger consumers (Gupta & Arora, 2020). However, this shift has not been uniform across all demographics. Reddy et al. (2018) emphasize that older generations, along with consumers in rural areas, still prefer traditional brick-and-mortar stores. Their decisions are often influenced by trust concerns, limited digital literacy, and a preference for tangible, in-person shopping experiences.

Challenges Faced by Local Retailers

As online shopping becomes more entrenched in consumer habits, local retailers—particularly those based in smaller towns and rural regions—are facing an array of challenges. One of the major obstacles is price competition. E-commerce companies often negotiate exclusive deals with manufacturers and benefit from economies of scale, enabling them to offer prices that small retailers simply cannot match (Rastogi, 2022). In terms of product range, local stores are constrained by shelf space and investment limitations, making it difficult to provide the variety available online (Sharma & Verma, 2019). Furthermore, logistical and supply chain

Inefficiencies, coupled with higher transportation costs, make operations significantly more expensive for small businesses (Patel, 2021). These factors together present a formidable barrier to their survival in the digital retail age.

Strategies for Local Business Survival

Despite the odds, many local businesses are finding innovative ways to adapt. Saxena and Agarwal (2021) highlight that by integrating digital payment systems and adopting customer-friendly technologies, local retailers can modernize their operations and stay competitive. Some have successfully partnered with online marketplaces, allowing them to tap into a broader customer base while maintaining a physical presence. Kumar and Singh (2022) also note the growing success of hybrid retail models, where businesses combine online visibility with offline service to cater to diverse consumer preferences. Furthermore, Das and Banerjee (2020) argue that fostering community cooperation among local businesses can lead to shared logistics, cost savings, and enhanced resilience against larger e-commerce players.

Changing Consumer Preferences

The widespread use of smartphones and affordable internet access has significantly influenced consumer behavior. According to Akther (2023), the growing trend of mobile internet usage has contributed to a surge in online shopping, with convenience and product variety being major driving factors. Manikandan (2017) identifies perceived usefulness, ease of navigation, and online security as core factors influencing digital purchasing decisions. These findings indicate a clear shift in consumer mindset, with technology now playing a central role in how shopping choices are made.

Competitive Landscape and Retailer Response

Traditional retailers are finding it increasingly difficult to match the scale, pricing, and variety of online stores. A study titled "A Study on the Effects of E-commerce on the Retail Industry in

India" (2022) observes that this competitive pressure is forcing many local businesses to rethink their models. While some have shut down, others have begun to establish their own online presence. Through websites, social media, and partnerships with logistics providers, these businesses are expanding their market reach and attempting to level the playing field.

Regulatory Framework and Consumer Trust

The legal environment has also evolved to support the digital shift. The introduction of the Consumer Protection Act, 2019, has been instrumental in building consumer trust in online platforms (Chawla & Kumar, 2021). Enhanced legal safeguards ensure secure transactions and promote transparency, encouraging more people to shop online. Chawla and Kumar also stress the importance of secure payment gateways and responsive customer service, which are critical in fostering long-term consumer loyalty in the digital space.

E-commerce and Transformation of Shopping Habits

Ranjan (2024) notes that the convenience of shopping anytime, from anywhere, has redefined consumer expectations. Price comparisons, user reviews, and one-click checkouts have become part of a seamless shopping experience. However, this shift has led to a drop in walk-ins at physical stores. B and Pasha (2024) report that traditional retail stores are seeing lower customer engagement, as operational costs rise and consumer footfall declines. Without digital adaptation, many risk becoming obsolete.

Opportunities for Integration and Support

Despite these challenges, opportunities remain for local retailers to evolve. Ranjan (2024) suggests that by adopting omnichannel strategies—where physical and digital sales channels are integrated—businesses can provide a better consumer experience. B and Pasha (2024) further propose that government-led training programs and policy incentives can empower small retailers to navigate the complexities of e-commerce, thereby fostering a hybrid and inclusive retail ecosystem.

Changing Demographics and Market Accessibility

The youth demographic plays a significant role in shaping the online marketplace. Mathur and Sharma (2014) found that nearly 75% of online shoppers in India are under the age of 35, making it vital for businesses to cater to their preferences. At the same time, Popli and Sarin (2016) highlight how access to online information—through blogs, reviews, and social media—has replaced traditional advertising, leading to smarter, research-driven purchase decisions. Jamwal and Soodan (2014) also note that e-commerce has penetrated deep into Tier II and III cities, expanding the market and presenting new opportunities for retailers willing to adapt.

Objective:

To examine the impact of online shopping on the performance of local retail businesses in Tugalpur by analyzing changes in consumer buying behavior, identifying the key challenges faced by local retailers in adopting digital platforms, and exploring consumer preferences that influence the shift towards e-commerce.

Research Methodology

This study employs a descriptive and analytical research design to examine the impact of online shopping on local markets in India. A combination of quantitative and qualitative research methods will be used to gather comprehensive insights from both consumers and local shopkeepers.

Data Collection Methods

To ensure a comprehensive understanding of the topic, the study will rely on primary data collection methods. Information will be gathered through structured surveys and semi-structured interviews. Surveys will be conducted with local shopkeepers to understand the specific challenges they encounter due to the rise of online shopping, as well as the strategies they employ to stay competitive in the market. Additionally, consumer surveys will be carried out to assess their shopping habits, preferences, and views on online versus offline shopping. In-depth interviews with selected retailers will further enrich the study by providing detailed insights into their personal experiences and adaptive approaches.

Sampling Technique

A non-probability convenience sampling method was used to select participants for this study. The sample consisted of 73 respondents from the Tugalpur area of Greater Noida, which included both local shopkeepers and consumers. This method was chosen to ensure easy access to participants and timely data collection. The sample provided a focused understanding of the local market dynamics, consumer preferences, and the impact of online shopping within the specific geographic context of Tugalpur. This approach allowed for the collection of relevant and practical insights directly from the community under study.

Findings

1. Customer Satisfaction and Demographics

Customer satisfaction levels differ significantly based on age groups and familiarity with online platforms. Younger consumers and those with more experience in online shopping tend to report higher satisfaction due to ease of use, faster transactions, and better digital literacy.

2. Need for a Hybrid Business Model

Local businesses in Tugalpur face growing pressure to adopt a hybrid retail model that integrates both physical and digital platforms. This approach is seen as essential to retain traditional customers while also appealing to the tech-savvy consumer base.

3. Transformation of the Traditional Retail Model

E-commerce has significantly disrupted the conventional retail structure in India, leading to changes in how local markets operate. Traditional retailers now compete not only on price but also on delivery speed, user experience, and digital presence.

4. Shift in Consumer Behavior and Market Dynamics

The rise of online shopping has altered consumer behavior, with increased emphasis on convenience, price comparison, and home delivery. These changes have reshaped market trends and intensified competition among retailers.

5. Importance of Adapting to Consumer Preferences and Regulations

Successful adaptation to evolving consumer needs—such as demand for mobile access, flexible payment methods, and personalized services—is crucial. Moreover, complying with digital commerce regulations ensures business continuity and trust.

6. Influence of Mobile Commerce

The widespread use of smartphones has fueled the growth of mobile commerce, making it a dominant channel for online shopping in India. Retailers are now optimizing platforms for mobile devices to meet customer expectations.

Conclusion

The rapid rise of e-commerce has brought significant changes to the traditional retail landscape in India, with local markets such as Tugalpur experiencing both challenges and new opportunities. Online shopping has reshaped consumer behavior, with increasing preference for convenience, competitive pricing, and mobile accessibility. As a result, traditional retailers are facing pressure to evolve and remain relevant in an increasingly digital marketplace.

While the shift towards e-commerce has created intense competition, it also opens avenues for local businesses to innovate and grow. The adoption of hybrid models that blend physical and digital experiences can offer a strategic advantage. Additionally, technological adaptation, customer-centric approaches, and awareness of evolving regulations are key for local retailers aiming to stay competitive.

India's e-commerce market is flourishing due to factors like increased internet penetration, widespread mobile usage, digital payment adoption, and a youthful consumer base. For the local economy, this trend has both disruptive and developmental implications. Businesses that embrace sustainable practices, innovate continuously, and align with consumer demands are better positioned for long-term success.

Suggestions

1. Adopt Hybrid Retail Strategies

   Local businesses should integrate online channels with traditional in-store services to offer flexible shopping experiences and expand their customer reach.

2. Invest in Digital Infrastructure

   Small retailers need to enhance their digital capabilities, including setting up user-friendly websites, mobile apps, and secure payment systems.

3. Understand and Respond to Consumer Preferences

   Businesses should regularly gather customer feedback to tailor services, focusing on convenience, affordability, and personalized engagement.

4. Embrace Innovation

   Innovative techniques such as loyalty programs, digital marketing, and customer engagement tools can help attract and retain shoppers.

5. Comply with E-commerce Regulations

   Staying informed and compliant with the latest digital commerce laws ensures credibility and avoids potential legal challenges.

6. Promote Sustainable Business Practices

   Implementing eco-friendly practices in packaging, delivery, and operations can enhance brand image and meet growing consumer demand for sustainability.

7. Training and Digital Literacy

Retailers and their staff should undergo regular training to improve digital skills, ensuring efficient management of online tools and customer interactions.

Reference

- Akther, R. (2023). Impact of mobile internet usage on online shopping behavior in India. Journal of Digital Consumer Trends, 11(2).
- B., R., & Pasha, S. A. (2024). The impact of e-commerce on traditional retail in India: Challenges and transformations. Indian Journal of Business and Retail Management, 9(1), 22–30.
- Chatterjee, P., & Kumar, A. (2021). Digital retail disruption: Effects of e-commerce growth on physical stores in urban India. International Journal of Retail Management, 16(3), 135–149.
- Chawla, R., & Kumar, S. (2021). Consumer trust and the legal framework in e-commerce: Post Consumer Protection Act, 2019. Journal of Legal and Economic Studies, 8(2), 54–61.
- Choudhary, V., & Dhillon, R. (2018). E-commerce reach and performance in small-town India: An analytical study. Journal of Rural Marketing, 6(1), 45–52.
- Das, T., & Banerjee, A. (2020). Collaborative strategies for local retailers in the digital age. Journal of Strategic Retailing, 5(2), 78–90.
- Gupta, A., & Arora, R. (2020). Evolving online consumer behavior in India: The role of convenience and trust. Journal of Indian Business Research, 12(4), 210–222.
- He, J., Zhang, M., & Li, Y. (2021). The role of online-to-offline models in transforming small businesses. Asia-Pacific Journal of E-Commerce, 3(3), 102–119.
- Jamwal, R., & Soodan, V. (2014). E-commerce growth in Tier-II and Tier-III cities: Challenges and prospects. Journal of Emerging Markets, 9(1), 33–41.
- Kumar, V., & Singh, N. (2022). Hybrid retail models and local business survival in the e-commerce era. Global Journal of Retail Management, 7(2), 91–106.
- Manikandan, R. (2017). Digital purchase decisions: An empirical study of ease of navigation and trust. International Journal of Technology and Management, 9(3), 143–152.
- Mathur, P., & Sharma, R. (2014). Young consumers and the online marketplace: A demographic overview of Indian online buyers. Indian Journal of Consumer Behaviour, 6(2), 78–86.

- Mishra, R., & Malhotra, P. (2019). Price sensitivity and the appeal of online discounts in Indian e-commerce. Journal of Marketing Insights, 13(1), 59–70.

- Patel, N. (2021). Logistical limitations for local retailers in the digital economy. Indian Journal of Supply Chain and Logistics, 4(4), 27–39.

- Popli, S., & Sarin, V. (2016). From advertisements to informed decisions: The role of online content in shaping consumer preferences. Journal of Contemporary Marketing, 5(3), 116–124.

- Ranjan, A. (2024). Changing retail expectations in the age of one-click shopping. Indian Journal of Consumer Trends, 10(1), 49–60.

- Rastogi, R. (2022). Price wars in Indian retail: How e-commerce is reshaping competition. Journal of Retail and Pricing Strategies, 8(2), 70–85.

- Reddy, K., Srinivas, P., & Bhatia, M. (2018). Traditional vs. digital retail: Preferences among rural and senior consumers. Journal of Consumer Research in India, 7(1), 91–104.

- Saxena, P., & Agarwal, A. (2021). Tech adoption among Indian local retailers: Opportunities and barriers. Journal of Small Business Innovation, 9(2), 128–137.

- Sharma, D., & Verma, S. (2019). Product diversity in e-commerce and the challenges for small retailers. Journal of Retail Science and Technology, 6(3), 52–65.

- Sivakumar, K., & Gunasekaran, M. (2020). The digital revolution in retail: Indian consumers and the shift to e-commerce. International Review of Business and Economics, 14(1), 101–113.

BEHAVIORAL FINANCE: UNDERSTANDING INVESTOR DECISION MAKING IN THE STOCK MARKET

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Abstract

This project delves into the intersection of psychology and finance, synthesizing insights from behavioral finance research to understand the complexities of financial decision- making. By scrutinising cognitive biases and heuristics, it challenges the assumption of rationality in traditional finance theory. The research scrutinises biases among investors and business students, exploring how personality traits contribute to perceptual errors in decision-making. Furthermore, it investigates the impact of behavioral characteristics on investment decisions across diverse financial markets, highlighting the roles of heuristic reasoning, prospect evaluation, market dynamics, herding, and behaviors.

Introduction

A framework known as "behavioral finance" replaces and/or enhances ordinary finance. The text depicts the conduct of investors and management during the decision-making process, as well as the results of their interactions inside the financial and capital markets. Because making judgements in complicated situations requires skill, and because investors often choose to make illogical decisions while making investments. As a result, selecting one option from the many options accessible is a special kind of art. While behavioral finance does not assert that all investors have the same delusions, it does highlight the steps that must be taken to prevent them from influencing decision-making, especially when it comes to investing.

The focus of behavioral finance research is on the potential effects of psychological variables on market performance. Psychological behaviors are widely believed to influence market outcomes and returns in the finance sector, especially when it comes to stock market returns, although there are many ways to observe them. A useful tool for comprehending market dynamics and the motivations underlying people's financial actions is the taxonomy of behavioral finance. In general, the essential concepts are included in behavioral finance. It describes how financial judgements about things like investments, payments, risk, and personal debt are greatly influenced by human emotion, biases, and the mind's cognitive limitations in processing and responding to information.

Among these, Mental accounting is a concept that is used to explain people's tendency to set aside money for specific desired outcomes. Later, the notion of "mental accounting" was invented, and says that people perceive their wealth accordingly based on its purpose, such as retirement or a student fund. Their findings subsequently laid the groundwork for the study of behavioral biases in finance and cognitive psychology, which is now a significant focus in the field of behavioral finance.

The term "emotional gap" refers to the sum of decision-making based on intense feelings or emotional strains, such as rage, fear, excitement, or worry. A person's incapacity to make rational decisions is sometimes greatly influenced by their emotions. The idea of behavioral finance originated with George Seldon's publication of "Psychology of the Stock Market" in 1912. Behavioral finance uses research on emotional tolerance and social and human recognition to identify and understand investing decisions.

The current study points out the impact of human rational and irrational behavior on investment decisions and analyzes the following variables connected to the behavioral finance phenomenon: heuristics, prospects, personality traits, feelings, moods, and ecological factors. The Efficient Market Hypothesis (EMH) states that market participants analyze stock prices rationally, taking into account both historical and current internal and external forces. When studying the stock market, behavioral finance assumes that markets are not completely efficient. This allows you to understand how social and psychological factors may influence stock purchases and sells.

Everyday stock and other trading market movements may gain from understanding and applying behavioral finance biases. Even though Investors and portfolio managers benefit greatly from understanding behavioral finance trends. When making judgments and speculating, these patterns can be used to help analyze market price levels and fluctuations. However, stock market bubbles are widely known for not having a positive influence on investments and the whole economy. A bubble in financial economics can be described as a systematic deviation of the market price of an asset from its inherent value (S. U. Ahmed et al., 2022; Burton, 2017). A stock market bubble is identified when an asset's trading price exceeds the discounted value of projected future cash flows (Aljifri,2023).

The primary cause of the 2006 Saudi stock market fall was the illogical actions of investors. The Tadawul All Share Index (TASI) grew significantly between 2003 and 2005. It peaked on February 25, 2006, and then the market crashed. By year's end, TASI had dropped by almost 65 percent of its original worth. Many Saudi investors had to sell their holdings or rely significantly on borrowed money during this time to finance their ventures. The amount of loans extended to Saudi nationals increased significantly; at the end of 2005, the gross balance was US$48 billion

(SAR 180 billion). These actions had dire repercussions, especially for typical Saudi households that had trouble making their loan payments.

This research is clearly relevant in developing markets, particularly Saudi Arabia's financial markets. This is due to the fact that biases in behavioral finance may significantly affect the gains and losses experienced by investors (Parveen et al., Citation2020). For instance, the overconfidence bias can result in excessive trading without enough financial understanding, which puts investors at risk of large losses and raises brokerage expenses. Similarly, because of the propensity to conflate recent occurrences with past occurrences, the representativeness bias might lead to the buying of expensive stocks. [2]Poor returns for stock market investors are a major problem caused by suboptimal investing decisions (Jaiyeoba et al., Citation 2018).

The degree of financial literacy influences how investors perceive risk. An increased degree of financial literacy makes investors more capable of comprehending and assessing the risks involved in investing. To create a link between risk perception, investment decision making, and behavioral finance, the risk perception variable must be included as a mediator (S. U. Ahmed et al., Citation2022). Behavioral finance acknowledges that people's emotional reactions and cognitive biases might affect their choice of investments. In this sense, risk perception is an important mediating element that helps explain how people see and understand hazards, which in turn influences how they make investments.

Gap Identification

Although there has been huge progress in understanding behavioral finance and investor decision-making, some considerable gaps in the literature still require further explanation. One of the gaps lies in the combination and synthesis of multiple heuristics and biases that impact investor decisions. Various studies have examined individual heuristics and biases, like availability, characteristics, overconfidence, and loss aversion. There is a scarcity of research that thoroughly investigates how these cognitive procedures interact and shape decision outcomes. All the present research papers delve into heuristics and biases as an entirely different subject and ignore the complex interplay and synergy effects that may arise with multiple cognitive methods at play. As a result, future research could take a more comprehensive approach, looking into the combined impact of various heuristics and biases on investor decision-making. Researchers can gain an improved comprehension of the principles that are bringing about the actions of investors in the stock market by figuring out the complex relationships between these cognitive processes.

Furthermore, while previous research has provided valuable insights into investor behavior, much of it focuses on static snapshots of decision-making, overlooking the ever-changing nature of investor behavior over time. Investor’s decisions are influenced by various factors, including market conditions, trends in the economy, personal experience, and social interactions, which evolve rapidly. However, there is a lack of thorough study into how the behavior of investors adapts and develops in response to changes in conditions. There are a few longitudinal studies that track investors' decision directions over time, capturing the complex changes and modifications in response to external triggers. Furthermore, longitudinal studies can shed light on the processes that drive decision stability or change, with important implications for investment strategies, financial education, and policy interventions.

However, future research must address the identified gaps by including multiple heuristics and biases along with longitudinal approaches that recognize the dynamic nature of investor behavior. Addressing these research gaps will help researchers advance the theoretical understanding of behavioral finance by contributing to the growth of more effective investment strategies and stock market policy interventions.

Objectives

- To examine how various biases and heuristics affect investors' decision-making.

- To determine practical methods for reducing the influence of behavioral biases on investing choices, as this will increase market eff[3]iciency and investor profits.

• To gain insight into cultural influences on investor behavior to enhance policy responses during economic uncertainty.

• To foster interdisciplinary collaboration to advance understanding of human behavior in financial markets and inform evidence-based policy decisions.

Litrature Review

Areiqat, A. Y., Abu-Rumman, A., Al-Alani, Y. S., & Alhorani, A. (2019). Impact of behavioral finance on stock investment decisions applied study on a sample of investors at Amman stock exchange. Academy of Accounting and Financial Studies Journal, 23(2), 1-17. When the influence of public knowledge about the decisions made by a herd or group overwhelms an individual's private information, this phenomenon is known as herding.

Sarkar, A. K., & Sahu, T. N. (2018). Analysis of investment behavior of individual investors of the stock market: A study in selected districts of West Bengal. Pacific Business Review International, 10(7), 7-17. Almost all investors seek to profit from the stock market in the short term.

Brochet F., Miller G.S., Naranjo P., Yu G. Managers' cultural background and disclosure attributes. Account. Rev. 2019;94(3):57–86. Values and Beliefs affect the way people interpret information and the subsequent responses to that information.

Bansal, T. (2020). Behavioral finance and COVID-19: cognitive errors that determine the financial future. Available at SSRN 3595749. Overconfidence is a specific kind of miscalibration, or cognitive bias when the level of confidence exceeds the accuracy level. In the example of the nation of India, its growth in GDP estimates for 2020 were considerably greater than the actual likely figure, even as investors observed the crisis take place in other nations that were both developing and advanced.

Ashraf B.N. Economic impact of government interventions during the COVID-19 pandemic: International evidence from financial markets. J. Behav. Exp. Finance. 2020;27:1–9 demonstrates how the government's actions during COVID-19 influenced the stock market's returns.

Gormsen N.J., Koijn R.S.J. Coronavirus: Impact on stock prices and growth expectations. Rev. Asset Pricing Stud. 2020;10:574–597. Investors' expectations of firms' future potential decreased significantly as a consequence of the Covid-19 outbreak, which contributed to a portion of the sudden decline in the world's stock markets.

Jim Frost. Representative Heuristics: Definition and Example. A cognitive bias known as the representativeness heuristic arises when evaluating the probability of an event by comparing it to a known mental prototype.

Fernandez-Perez, A., Gilbert, A., Indriawan, I., & Nguyen, N. H. (2021). COVID-19 pandemic and stock market response: A culture effect. Journal of Behavioral and Experimental Finance, 29, 100454 Reactions to COVID-19 are normally driven by behavioral factors such as fear and unfamiliarity.

Ah Mand, A., Janor, H., Abdul Rahim, R., & Sarmidi, T. (2023). Herding behavior and stock market conditions. PSU Research Review, 7(2), 105-116. Their study's conclusions showed that Shariah-compliant investors engage in herding behavior while the market is rising and that this behavior has an unpredictable connection with market return. While herding behavior only exists in conventional stocks at a down market. Furthermore, when looking at the market as a whole, non-linear herding behavior occurs only during a down market; in an up market, herding behavior has a direct correlation with market return. These findings are robust when considering the financial issues for all of the samples and market scenarios.

Daniel Kahneman, Paul Slovic and Amos Tversky (1982). Judgment under Uncertainty: Heuristics and Biases, Cambridge University Press. All thinking is based on cognitive algorithms which function instinctively below the level of consciousness. "Heuristics" refers to both natural and subconscious behaviors, as well as learned or consciously selected rules of thumb.

Research Methodology

Primary Research

The primary research involved gathering firsthand data from investors and business students through structured surveys. The focus was on understanding cognitive biases, heuristics, and their impact on investment decisions. Respondents were selected from diverse financial backgrounds to ensure varied perspectives. The survey questions were designed to analyze behavioral characteristics, market responses, and individual decision- making patterns.

Additionally, case studies of past stock market movements, particularly the Saudi stock market crash of 2006, were analyzed to correlate investor behavior with market trends.

Secondary Research

The secondary research was conducted through an extensive review of literature, including academic journals, financial market reports, and books on behavioral finance. The study incorporated works by Tversky and Kahneman (1982) on heuristics and biases, along with contemporary research examining investor psychology and financial decision-making.

Key areas of secondary research included:

- Literature on heuristic reasoning and market inefficiencies
- Case studies on investor overconfidence and risk perception
- Impact of external factors like economic downturns and global crises (e.g., COVID-19) on investment behavior
- Studies on herding behavior and emotional biases affecting stock market volatility

By integrating both primary and secondary research methodologies, the study presents a comprehensive analysis of behavioral finance and its real-world implications.

Method of Sampling

To identify participants who are active stock market investors, we used a non-probability sampling technique called snowball technique. Retail and small institutional investors were among the 30 participants whose answers were surveyed. To obtain a balanced view on behavior patterns, investors from different age groups, levels of experience, and risk appetites were deliberately included.

Methods of Data Analysis

This method analyzes investors' demographics, trading frequency, portfolio diversification, and general decision-making style with the use of statistical techniques. The analysis of behavioral patterns focused primarily on the following cognitive biases in investment decision-making: anchoring, herd behavior, overconfidence, and loss aversion.

With the help of correlation analysis, the dependence between an investor's level of experience and the degree of bias to which they are subjected is analyzed.

Qualitative Analysis

The decision to buy or sell in an uncertain market is studied with the help of open-ended questions to reveal the psychological factors behind the decision.

Research limitation

- An example of a limitation would be the small sample size of 30 investors which can lead to a lack of diversity in representing the target population.
- Relying on self-reported information tends to increase the chances of social desirability bias, particularly in regard to emotional answers and risk-taking questions.
- The study may not fully represent the actions of institutional or rural investors in other areas because it is restricted to *urban retail investors in India.
- Because behavioral tendencies are subjective, they may alter over time or in reaction to outside circumstances like market meltdowns or legislative changes.

Findings

- **Cognitive biases significantly impact investment decisions**, leading to deviations from rational financial theories.
- **Heuristic shortcuts often result in irrational trading behaviors**, such as overconfidence and loss aversion.
- **Herding behavior is prominent in volatile markets**, causing artificial price inflations and bubbles.

- **Risk perception varies based on financial literacy**, with knowledgeable investors making more calculated decisions.
- **Emotional factors like fear, greed, and regret influence trading patterns**, often leading to suboptimal investments.
- **Market inefficiencies arise due to irrational investor behaviors**, challenging the Efficient Market Hypothesis.
- **Economic crises intensify behavioral biases**, leading to exaggerated market reactions and panic-driven selling.

Suggestions

- **Financial education programs should be promoted** to improve investor awareness of behavioral biases.
- **Investment strategies should incorporate behavioral finance principles** to minimize emotional decision-making.
- **Policymakers should develop regulations** to curb excessive speculation driven by herd mentality.
- **Investors should utilize data-driven decision-making tools** to counteract biases and improve rational investing.
- **Behavioral coaching for investors** can help mitigate irrational trading behaviors and enhance financial discipline.
- **Greater emphasis on market transparency** can reduce susceptibility to misinformation and speculative trading.

Conclusion

Behavioral finance provides valuable insights into the psychological factors influencing investment decisions. This study highlights the role of cognitive biases, heuristics, and emotions in shaping financial choices, often leading to irrational outcomes. The research demonstrates that investor behavior significantly impacts market efficiency, sometimes resulting in financial bubbles and crises. By understanding these behavioral tendencies, investors and policymakers can implement strategies to mitigate their negative effects. The findings suggest that increased financial literacy and data-driven decision-making can help investors navigate market uncertainties more effectively. Additionally, incorporating behavioral finance theories into policy frameworks can enhance market stability. Addressing biases and heuristics in financial decision-making is crucial for both individual investors and the broader financial ecosystem. This study underscores the need for continued research in behavioral finance to develop more resilient financial strategies and improve investor outcomes.

Bibliography

- Sarkar, A. K., & Sahu, T. N. (2018). Analysis of investment behaviour of individual investors of stock market: A study in selected districts of West Bengal. Pacific Business Review International, 10(7), 7-17.

- Madaan, G., & Singh, S. (2019). An analysis of behavioral biases in investment decision-making. International Journal of Financial Research, 10(4), 55-67.

- Areiqat, A. Y., Abu-Rumman, A., Al-Alani, Y. S., & Alhorani, A. (2019). Impact of behavioral finance on stock investment decisions applied study on a sample of investors at Amman stock exchange. Academy of Accounting and

- Financial Studies Journal, 23(2), 1-17.

- Bansal, T. (2020). Behavioral finance and COVID-19: cognitive errors that determine the financial future. Available at SSRN 3595749.

- Fernandez-Perez, A., Gilbert, A., Indriawan, I., & Nguyen, N. H. (2021). COVID-19 pandemic and stock market response: A culture effect. Journal of behavioral and experimental finance, 29, 100454.

- Ah Mand, A., Janor, H., Abdul Rahim, R. and Sarmidi, T. (2023), "Herding behavior and stock market conditions", PSU Research Review, Vol. 7 No. 2, pp. 105-116.

EMPIRICAL ANALYSIS OF FACTORS AFFECTING FOREIGN STUDENTS' SATISFACTION PURSUING HIGHER EDUCATION IN INDIA: A REVIEW PAPER

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Abstract

Background: International students encounter numerous challenges while studying in India. This study seeks to systematically collect and examine the difficulties faced by these students during their academic journey in the country.

Purpose: This study aims to study challenges encountered by foreign students while pursuing higher education in India.

Methods: To collect and examine the challenges faced by foreign students in higher education systematically, a comprehensive study of 28 research papers were done. Data were extracted from Scopus database.

Results: The analysis of the literature yielded that a longitudinal study needs to be done to track how the challenges encountered by international students change over a period as student progress in their higher education. Furthermore, there is a need to explore the role of Institutions in easing transition throughout the career progression (Pre-Departure to Post-Study). Additionally, we need to study the contribution by foreign students in increasing diversity on the campus and in the classroom and the efforts by the university to tap on this diversity to enhance quality and learning experience (for everyone), at various stages of their stay.

Conclusion: It is crucial to investigate the difficulties faced by foreign students in Indian higher education. Academic institutions should prioritize student well-being, as it influences academic success and can lead to psychological problems. International students bring diversity on the campus and in the classroom and the universities should tap on this diversity to enhance quality and learning experience (for everyone).

Keywords: Challenges, career progression, diversity, quality

Introduction

Every year, a significant number of foreign students choose India as their destination for higher education. However, transitioning to a new country brings various Economic, social, and political difficulties (. Upon arrival, these students find themselves in an unfamiliar environment where they must quickly adapt to different norms, languages, and behaviours. In the initial stages, many struggle with uncertainty—unsure how to communicate effectively or interpret social cues. This unfamiliarity forces them to develop coping strategies to ease their adjustment. Whether through peer support, cultural immersion, or institutional guidance, international students must navigate these challenges to succeed in their academic and personal lives in India.

It is believed that the development of awareness regarding international student motives and challenges faced by them will make India as a new education hub for higher education. Such awareness will also help in determining social integration across different countries.

With the rapid growth of its higher education sector, India is transforming into both a major destination for international students and a leading source of global talent. The country boasts one of the world's largest higher education systems, comprising a diverse network of institutions. Official records from early 2024 indicate India has 1,113 universities, including 56 central universities funded by the national government, numerous state universities established by local governments, deemed universities granted special status by the University Grants Commission, private institutions operating under regulatory frameworks. This expanding educational landscape positions India as an increasingly important player in global academic mobility, serving as both a regional education hub and a significant contributor to international student populations worldwide.

The National Education Policy 2020 (NEP 2020) signifies a pivotal change in India's educational framework, fostering the internationalization of higher education to enhance global engagement and collaboration. The policy outlines several key strategies to transform India into a preferred global education destination:

1. Global Standards Alignment
- Enhancing the quality of Indian institutions to meet international benchmarks.
- Creating an academic environment that attracts students worldwide.

2. Cross-Border Academic Partnerships
- Encouraging collaborative research projects with top global universities.
- Establishing faculty and student exchange programs with foreign institutions.

3. Institutional Expansion
- Supporting high-performing Indian universities to open international campuses.
- Facilitating entry of top 100 global universities to operate in India.

4. Academic Mobility Support
- Recognizing foreign academic credits for degree completion in India
- Offering financial assistance and fellowships for international collaborations

This comprehensive framework aims to position India as both a competitive education hub and an active participant in global knowledge exchange, while maintaining its distinct academic identity.

India's NEP 2020 aims to transform higher education by attracting global talent through quality upgrades, international collaborations, and cross-border academic programs. The policy facilitates foreign university partnerships, eases credit transfers, and supports student exchanges while encouraging top Indian institutions to expand overseas, positioning India as a premier education destination.

India accounts for less than 1 percent of the world's international students (United Nations Educational, Scientific and Cultural Organization – UNESCO, 2021). Only 72,218 international students from 200 countries choose India in 2024 (Times of India, 2024) as compared to 1,330,000 Indian students studied abroad (MEA, 2024).

According to Project Atlas 2024, the US has the most number of international students followed by Canada, UK & Australia. China received 200,892 overseas students in 2024 while South Korea had 208,962.

INBOUND STUDENTS IN SELECT COUNTRIES

	2023 Release	2024 Release	% Change
United States	1,057,188	**1,126,690**	**6.6%**
Canada	660,230	**842,760**	**27.6%**
United Kingdom	718,085	**758,855**	**5.7%**
Australia	361,247	**437,485**	**21.1%**
France	392,630	**412,100**	**5.0%**
Germany	349,438	**367,578**	**5.2%**
Russia*	282,922	**321,845**	**13.8%**
South Korea	N/A	**208,962**	**N/A**
China*	210,903	**200,892**	**-4.7%**
Spain	135,478	**149,279**	**10.2%**
Japan	181,741	**138,357**	**-23.9%**
Netherlands	122,287	**130,863**	**7.0%**
Argentina	117,820	**122,769**	**4.2%**
Italy	132,521	**109,975**	**-17.0%**
Poland	85,897	**105,404**	**22.7%**
Mexico	53,801	**62,161**	**15.5%**
Hungary	41,730	**43,137**	**3.4%**
Sweden	39,806	**41,699**	**4.8%**
New Zealand	24,515	**36,560**	**49.1%**
Denmark	27,391	**27,741**	**1.3%**
Philippines	24,520	**N/A**	**N/A**
Chile	19,998	**22,360**	**11.8%**
Norway	24,154	**18,129**	**-24.9%**
Israel	10,029	**6,303**	**-37.2%**

Source: *Project Atlas*, 2023 & 2024; **UNESCO 2024*

International students play a key role in generating revenue, promoting diversity on campus and in the classroom, facilitating holistic learning. Additionally, they are an important factor in determining the ranking of HEIs, as highlighted by the National Institutional Ranking Framework (2021).

Literature Review

As economic globalization accelerates, higher education is becoming increasingly internationalized. More international students are choosing India for their studies, attracted by its world-class universities that offer high-quality education to both domestic and international students. However, foreign students face challenges (Jean Kaya, 2020) that hinder their ability to adapt to the new environment, affecting their university life and academic experience.

Research into these challenges is crucial for facilitating their successful adjustment. This review aims to highlight the difficulties international students encounter while pursuing higher education in India, drawing on studies from various countries that identify common issues faced in both Indian and foreign universities.

University students experience significant mental health challenges, often greater than those in the general population. Academic stress, peer pressure, financial constraints (Ebrahim et al., 2021), and lifestyle changes are contributing factors which influence mental health. (Mubashir Gull et al., 2025).

Acculturative stress influences academic performance of international students. Academic stress consists of language barriers, cultural differences, and students social isolation. (Sarita Sharma et al., 2024).

The paper "The Interaction Effect of Perceived Social Support and Perceived Stress on Acculturative Stress among Ethiopian International Students in India" (Nalini Malhotra et al., 2020). focuses on how different sources of social support (family, friends, significant others) influence the relation between acculturative stress and perceived stress. The study highlights that:

- There is a significant negative correlation between perceived social support and its components with acculturative stress.
- Perceived stress is positively and significantly correlated with acculturative stress.
- Perceived social support (its composite score) moderate the relation between acculturative stress and perceived stress.
- Perceived social support (friend, family and others) moderate the relationship between acculturative stress and perceived stress.

Vikram Kumar et al. (2024) highlights the importance of social media as a key information source for international students. These students often rely on social media for extra information, emphasizing the significance of Integrated Marketing Communications in university marketing efforts. Clear messaging and careful selection of appropriate social media platforms are crucial for reaching students and aiding in their decision-making process. The study also finds that word-of-mouth and informal channels play a vital role in raising awareness.

Sicka et al. (2024) highlights the urgency of understanding their experiences and the role of social media in their navigation of these challenges.

Jeevan Khanal et al. (2019) identified challenges and their implications for policymakers and educators by categorizing international student challenges into three stages:

Pre-Departure Challenges

1. Obtaining accurate information about universities is a major issue.
2. International students struggle with admission requirements, visa procedures, and financial planning.
3. Indian students are particularly sensitive to currency fluctuations, impacting their financial decisions.

Post-Departure Challenges

1. Language barriers remain a significant issue for students from non-English-speaking countries.
2. Social isolation and cultural differences create psychological stress.
3. Financial stress, due to high tuition fees and limited work opportunities, is a recurring issue.

Post-Study Challenges

1. Many international students struggle with work visas and permanent residency after graduation.
2. Reverse culture shock affects students who return home, making reintegration difficult.
3. Countries like Canada and Germany provide better post-study work opportunities, while the US and UK have stricter immigration policies.

Yulia P. Ten et al. (2021) addressed the growing need for higher education institutions (HEIs) to adapt to increasing cultural diversity among international students. It emphasizes the need to build an adaptive academic environment by clustering students based on cultural attributes, thereby enhancing integration and educational success.

Oleg Legusov et al. (2022) examines equity, diversity, and inclusion (EDI) from the perspective of international community college students in Canada. It highlights the rapid growth of international students in Canadian community colleges and their underrepresentation in research. It highlights challenges faced by international students (e.g., stereotyping, limited engagement in class, lack of awareness of college resources)., inequities in tuition fees, financial aid, and career services, barriers to seeking help (e.g., cultural differences, inflexible office hours), limited interaction with domestic students and faculty biases.

Yan Guo et al. (2020) state that 95% of Canadian universities prioritize internationalization (Universities Canada, 2014). Teacher education programs increasingly incorporate global experiences, but only 11% of undergraduates study abroad.

Andrew Deuchar (2022) critiques the traditional approach of examining international students' "experiences" in higher education, arguing that this framework limits their agency. Instead, it proposes focusing on their "practices," which highlights how international students actively contribute to educational spaces rather than being passive recipients.

Prof. (Dr.) Vedvyas Dwivedi (2023) evaluates the impact of NEP on internationalization, highlighting challenges in policy execution and equity. Recommendations include simplifying visa and accreditation procedures, increasing mobility program funding, and addressing digital gaps in online education.

Scott William et al. (2024) qualitatively examines the challenges faced by international students and propose strategies to enhance support and graduate outcomes. Major issues include difficulties transitioning to Australian education, acculturation challenges, social integration struggles, employment and financial hardships, healthcare access, mental well-being concerns, and uncertainty after graduation.

Mark Finn et al. (2020) investigate how international pre-service teachers (PSTs) perceive their cultural identity in a simulated classroom context. The study suggests employing virtual reality (VR) simulations to enhance reflective practices in teacher education.

Elizabeth Buckner et al. (2021) examines how 62 universities from Canada, the U.S., and the U.K. incorporate international students into their internationalization strategies. While institutions emphasize diversity, they often avoid directly addressing race and racism, despite most international students being non-white. The study critiques this performative approach and advocates for openly addressing race and racism to create genuinely anti-racist campus environments.

Widiasih et al. (2020) highlight the need for improved pre-arrival information for prospective international students, covering both academic and non-academic aspects of studying in Indonesia.

Pawar et al. (2020) examined the key factors that shape international students' choices to study at Indian universities. The most important were university features like teaching quality, safety, and rankings, with affordability being a secondary concern.

Objectives

- To analyze country specific challenges faced by international students while pursuing higher education.
- To analyze the impact of social, legal and technological factors on students progress in their higher education.
- To explore the role of Institutions in easing transition throughout the career progression (Pre-Departure to Post-Study)
- To investigate the impact of student diversity of campus on classroom learning students in increasing diversity on the campus and in the classroom.
- To study the efforts by the university to tap on this diversity to enhance quality and learning experience (for everyone), at various stages of their stay.

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Research Methodology

Sources of Data and Techniques for Searching

We devised a streamlined approach to gather appropriate journals from January 2000 to April 2025. This process involved identifying terms pertaining to challenges encountered by international students in universities. Independent searches were performed using the Scopus database. The below examples demonstrating how key terms guided the search process.

The search covered article titles containing keywords like ‘challenges’, ‘international students’, ‘academic problems’, ‘higher education, ‘Stress’, ‘diversity’, ‘foreign students’, ‘University Students’, and ‘College Students’, ‘India’. We carefully examined the titles, abstracts, and full texts of pertinent articles. In this process, 38 Scopus indexed publications were obtained. We acquired all 38 publications.

Data Cleaning

An excel sheet was prepared for these 38 publications with publication's details, including the title of the journal, list of authors, year of publication, research objective, research focus, methodology used, limitations, reference list were incorporated for analysis. Peer review was done by Ms. Ayushi. & Dr. Vandana (Ph.D. scholars, Sharda University) checked the journals for accuracy, excluding duplicates and irrelevant journals. Ultimately, 28 set of refined articles were utilized for the analysis.

Analyses

The 28 refined articles obtained from the data cleaning process were analyzed to know the key findings and to know the gaps for future study. A thorough analysis of each article was done in terms of research objectives, research methodology, research outcomes and limitations. After analyzing all the articles, key findings were documented and future scope of study were identified.

Research Findings

Challenges encountered by International students

The international students pursuing higher education in India face academic, psychosocial and psychological issues in India. These issues can be categorized into three broad themes:

- Psychosocial Problems: Adjustment issues, low self-esteem, loneliness.
- Academic Problems: Academic stress, poor concentration, low grades.
- Psychological Problems: Suicidal ideation, stress, eating disorders, drug addiction, depression, anxiety, smartphone addiction.
- Acculturative Stress: Factors like Language Barriers, Cultural Differences, Social Isolation impact the academic performance of the students.
- Academic Challenges: Language Barrier, Pedagogy, Assessment Methods.
- Socio-Cultural Challenges: Attachment & Acculturation, Ethnocentrism & Cultural Awareness
- Financial & Work Restrictions: Visa restrictions, High tuition and living costs.
- Social Isolation & Discrimination: students experience racism, microaggressions, and exclusion, differences in social norms and networking styles create barriers to making friends.
- Mental Health & Well-Being: International students have higher rates of anxiety, depression, and stress.
- In addition, the students face academic stress, peer pressure, financial strain, and lifestyle changes as contributing factors.

Challenges vary from Pre-Departure to Post-Study

The challenges encountered by international students vary from Pre-Departure to Post-Study.

- Pre-Departure Challenges include Obtaining accurate information about universities, struggle with admission requirements, visa procedures, and financial planning, currency fluctuations.

- Post-Departure Challenges include language barriers, social isolation, cultural differences and financial stress.
- Post-Study Challenges include struggle with work visas and permanent residency after graduation, reverse culture shock affects students who return home.

Role of Institutions

The universities play an important role in reducing the challenges faced by the international students. They should employee coping strategies like social Support, Institutional Support, extracurricular activities which will help in lower the stress level of the students.

Diversity

Higher education institutions (HEIs) should adapt to increasing cultural diversity and inclusion (Legusov et al., 2023) among international students. Adaptive academic environment to be built by clustering students based on cultural attributes, thereby enhancing integration and educational success. Indian teacher education programs should increasingly incorporate global experiences.

Conclusion

International students are a major source of review for the institutions and for the country but little has been done to reduce the challenges faced by them.

Review suggests that not much work/study have been done in the area of challenges encountered by foreign students pursuing higher education in India. The international students are not prepared for the challenges like Psychosocial Problems, Psychological Problems, Acculturative Stress, Academic Challenges, Socio-Cultural Challenges (Yılmaz et al., 2022). Furthermore, the role of institutions in easing the challenges is not comprehensively defined due to which the international students face social isolation & discrimination.

The international students are not only a major source of revenue and but as well bring diversity on the campus and in the classroom. This is a great opportunity for the institutions to tap on this diversity to enhance the quality and learning experience for everyone. This help in quality and skilled workforce being produced by India and help in development of the society.

Recommendations

- Future research in this field should examine the problems faced by foreign students (from different nationalities), at different stages of their stay (during pre-departure till post study)
- Furthermore, how these challenges evolve over time should be examined.
- Also, the role of Institutions to be explored at different stages to address these challenges to ease the transition during pre-departure till post study.
- Future research should use focus on the contribution by foreign students in increasing diversity on the campus and in the classroom and their contribution to learning experience (due to diversity).
- The efforts by the university to tap on this diversity to enhance quality and learning experience (for everyone), at various stages of their stay should be explored.

References

- Gull, M., Kaur, N., Abuhasan, W.M.F., Kandi, S. & Nair, S.M., 2025. A comprehensive review of psychosocial, academic, and psychological issues faced by university students in India,1-11
- Sharma, S., Verma, S. & Raj, A., 2024. Academic performance and acculturative stress: Challenges faced by international students in Delhi NCR,26250-26253
- Malhotra, N. & Seifu, K., 2020. The interaction effect of perceived social support and perceived stress on acculturative stress among Ethiopian international students in India,122-132
- Astley, M., 2024. Cross-cultural challenges faced by international students: A case study of Indian postgraduate students at a London-based business school,971-986.
- Chennamsetti, P., 2020. Challenges faced by Indian international students in US higher education. Journal of Interdisciplinary Studies in Education,249-263
- Vakkai, R.J., Harris, K.S., Chaplin, K.S., Crabbe, J.J. & Reynolds, M., 2020. Sociocultural factors that impact the health status, quality of life,and academic achievement of international graduate students: A literature review,758-771
- Legusov, O., Jafar, H. & Bégin-Caouette, O., 2023. International students at Canadian colleges: Emerging trends,254-278
- Kumar, V. & Raman, R., 2020. Social media by Indian universities—does it convince or confuse international students in university choice?,167-179
- Khanal, J. & Gaulee, U., 2019. Challenges of international students from pre-departure to post-study,560-573
- Widiasih, R., Hermayanti, Y. & Ermiati, 2020. International students' experience of studying at Indonesian universities: A systematic review,24-39
- William, S., Peters, K. & Hegazi, I., 2024. A qualitative exploration of challenges for international students enrolled in health professional education degrees in Australia,468-490
- Deuchar, A., 2022. The problem with international students' experiences and the promise of their practices: Reanimating research about international students in higher education,504-514
- Kaya, J., 2020. Inside the international student world: Challenges, opportunities, and imagined communities,124-144
- Katsumoto, S., Stroup, N.R. & Barnhardt, C.L., 2023. Unsettling experiences: Factors that discourage international students from desiring research and teaching careers,1-12
- Abdalla, F.M.A., 2024. Belonging as a post-secondary inter/national student: Where do I belong?,1047-1063
- Dwivedi, V. & Joshi, M., 2023. Empowering internationalization: A critical analysis of the National Education Policy (NEP) on higher education in India,4436-4465
- Sicka, B., de Ungo, N. & Gregory, D., 2024. Social media sanctuaries: A discourse analysis of Indian international students' agency and liminality during the Russian-Ukrainian conflict,53-69
- Fakunle, O., 2020. Developing a framework for international students' rationales for studying abroad, beyond economic factors,671-690

- Weng, E., Halafoff, A., Barton, G. & Smith, G., 2021. Higher education, exclusion, and belonging: Religious complexity, coping, and connectedness among international students during the COVID-19 pandemic in Australia,1-22
- Yılmaz, K. & Temizkan, V., 2022. The effects of educational service quality and socio-cultural adaptation difficulties on international students' higher education satisfaction,1-18
- Pawar, S.K., Vispute, S., Islam, T. & Chanda, R., 2020. International students' motivations for studying in Indian universities: Implications for value proposition and positioning strategies,158-170.
- Ebrahim, A. & Chauhan, R., 2021. A study on the impact of physical and economic environmental factors on motivation of Indian expat students in pursuing higher education in the UAE,283-296
- Singh, A. & Halim, H., 2023. Addressing challenges in language teaching in India: Exploring the role of corrective feedback in enhancing learning,152-184
- Ten, Y.P., Prikhodko, L.V. & Linnikov, A.S., 2021. International students' cultural diversity clustering for building HEI's adaptive academic environment,159-172
- Legusov, O., Leong, J., Thu Le, A. & Ramdass, J., 2022. Equity, diversity, and inclusion from the perspective of international community college students,121-134.
- Finn, M., Phillipson, S. & Goff, W., 2020. Reflecting on diversity through a simulated practicum classroom: A case of international students,71-85
- Buckner, E., Lumb, P., Jafarova, Z., Kang, P., Marroquin, A. & Zhang, Y., 2021. Diversity without race: How university internationalization strategies discuss international students,32-49
- Guo, Y. & Guo, S., 2020. Internationalization of Canadian teacher education: Teacher candidates' experiences and perspectives,425-449

THE GREEN GAP: EVALUATING THE EFFECTIVENESS OF INDIA'S ENVIRONMENTAL LAWS

SATPATHY GAYATREE GS

KAJAL YADAB

Abstract

A literature review on environmental pollution is a comprehensive examination of the existing research and scholarly work related to various aspects of environmental pollution. Environmental pollution encompasses a wide range of topics, including air pollution, water pollution, soil contamination, noise pollution, and more. Below, I'll provide an overview of key findings and trends in the literature related to environmental pollution. The authors critically analysed the basic environmental laws and tried to suggest convincing solution to encounter the problem described in this article.

I. Introduction

"The greatest threat to our planet is the belief that someone else will save it."[1]

- Robert Swan

Environmental pollution is a pressing global issue that poses a significant threat to the health of our planet and its inhabitants. Defined as the introduction of contaminants into the natural environment, pollution can take various forms, including air, water, soil, and noise pollution. This article will delve into the causes and effects of environmental pollution and explore potential solutions to mitigate its impact on the planet.

Effects of Environmental Pollution:

1. Air Pollution: Respiratory problems, cardiovascular diseases, and adverse effects on wildlife are consequences of air pollution. Ground-level ozone, particulate matter, and pollutants such as Sulfur dioxide and nitrogen oxides have harmful health impacts.
2. Water Pollution: Water sources which are contaminated always lead to waterborne diseases in humans and harm aquatic life. Chemical pollutants, heavy metals, and excess nutrients disrupt ecosystems and pose threats to biodiversity.
3. Soil Pollution: The presence of hazardous chemicals and heavy metals in the soil affects plant growth, contaminates food crops, and enters the food chain, ultimately impacting human health.

As we reflect on the causes and effects of pollution, it becomes evident that our collective actions have far-reaching consequences for the health of our planet and the well-being of its inhabitants. Addressing environmental pollution requires a multifaceted approach that encompasses regulatory measures, sustainable practices, and a fundamental shift in our attitudes towards the environment. Governments must play a major and most important role in implementing plus enforcing stringent environmental regulations to curb industrial emissions, regulate waste disposal, and promote sustainable development.

[1] Quote by Robert Swan

Investing in research and technology to develop innovative solutions for pollution control is imperative for long-term environmental sustainability. In conclusion, the fight against environmental pollution is a collective responsibility that transcends borders and ideologies. It requires a paradigm shift in how we perceive and interact with our surroundings.Environmental laws lays through the overall objectives, and it is up to the administrators to carry them out. Because policy is a tool for transforming a given environment into a chosen environment, its formulation becomes essential. We can accurately identify problems, prioritize different approaches and solutions, choose an option based on a thorough analysis of costs and benefits, articulate the decision in terms of stated goals, provide structure, staff, and resources to ensure successful implementation, and establish a system for ongoing policy monitoring through the use of policies.Environmental pollution is a complex and multifaceted challenge that requires coordinated efforts at local, national, and global levels. By addressing the root causes of pollution and implementing sustainable practices, we can work towards a cleaner, healthier planet for current and future generations. It is crucial for individuals, communities, and governments to collaborate in finding innovative solutions to mitigate the impacts of environmental pollution and ensure a sustainable and thriving future.

II. Keywords

Air Pollution, Water pollution, Soil Pollution, Smog, Nutrient pollution, Oil spills, Hazardous waste,Soil erosion, Illegal dumping, Contaminated land

III. Review of Literature

This article discusses the importance of a healthy environment for the living beings because individuals to grow in every aspect and it is very crucial that a well to do atmosphere is recognized as our fundamental right. The country must adopt an active and dynamic philosophy and structural framework into its legal system. The Indian jurisdiction is an example of this, as its strong constitutional framework enhances the legal framework for the conservation of a healthy environment. Authors emphasizes importance of recognizing the safe environment as fundamental right. Few reports mention that, in a human Environment, man has various ways to live a peaceful and dignified life, Promotion of different policies which rises suppression must be eliminated.

This article additionally highlights the significance of carefully arranging or managing the earth’s natural resources, all elements essential for humans to survive on this planet, as well as representative examples of natural environments, for the benefit of both the present and the future generations. It is essential to safeguard the earth’s ability to generate essential renewable resources. It is imperative to acknowledge the right to an appropriate environment as fundamental in accordance with the United Nations Declaration. According to Dr. Abdul Haseeb Ansari, life itself or at least a respectable quality of life could not exist in the absence of a healthy environment. The core element of human rights is the right to life[2], which is a natural and fundamental right. This article emphasizes how crucial it is to acknowledge that everyone has this right which also includes the right to live in safe, neat, clean and hygienic place. States can then endeavour to promote a more equitable and sustainable environment for individuals.

This course discusses the concept of environmental law and policies, focusing on the natural environment and its impact on human well-being. The United Nations Declaration on human environment emphasizes that humans are both creatures and moulders of their environment,

[2] Article 21 of the Indian Constitution

providing physical substance and opportunities for intellectual, moral, social, and spiritual growth. A living thing's environment can refer to a variety of things, such as its surroundings, resources at hand and external stimuli. The sum of all environmental factors affecting the existence, growth and development of living things is referred to as the natural environmental. It involves natural occurrences like break down, decomposition, changes in the climate, meteorological phenomena and resources from nature in addition to ecological units like promotion of fundamental human rights, such as the liberty of life itself and the utilization of those rights depend heavily on environmental laws and policies. Upholding environment friendly habits, preserving the environment and ensuring the welfare of future generations as well as present all depend on an understanding of environmental law.

It is a dynamic and evolving field that continues to be of critical importance in the face of global environmental challenges. Addressing these environmental pollution problems requires a combination of regulatory measures, technological innovations, public awareness and engagement, and sustainable practices. Collaborative efforts at local, national, and international levels are essential to mitigate and prevent further environmental pollution. It is a pressing issue with various specific problems and challenges. Some of the key issues related to environmental pollution include:

Climate Change: One of the most critical global environmental issues is climate change, driven by the release of greenhouse gases into the atmosphere. This results in rising global temperatures, sea-level rise, and more frequent and severe weather events.

Air Quality: Poor air quality, caused by emissions from vehicles, industrial processes, and agriculture, contributes to respiratory diseases and cardiovascular problems. It affects the health and well-being of people in urban and industrial areas.

Water Quality: Pollution of water bodies, including rivers, lakes, and oceans, threatens aquatic ecosystems and the availability of safe drinking water. Contaminants such as heavy metals, pesticides, and plastics pose significant challenges.

Soil Contamination: Soil pollution from industrial activities, agricultural practices, and improper waste disposal can lead to reduced agricultural productivity and pose long-term risks to ecosystems and human health.

Noise Pollution: Noise pollution disrupts the quality of life in urban areas, affects mental health, and can have adverse physiological effects on individuals.

Waste Management: Improper waste disposal and the accumulation of non-biodegradable waste, such as plastics, create significant environmental and health problems. Landfills and incineration contribute to pollution and greenhouse gas emissions.

Chemical and Hazardous Waste: The improper handling and disposal of toxic and hazardous substances can lead to environmental accidents and long-term contamination, posing health and safety risks.

Loss of Biodiversity: Pollution disrupts ecosystems and leads to habitat destruction, contributing to the decline of plant and animal species. This loss of biodiversity has far-reaching consequences for ecosystem stability and human survival.

Disproportionate Impacts: Environmental pollution often affects vulnerable and marginalized communities more severely, leading to environmental justice issues and health disparities.

Resource Depletion: Pollution is closely tied to the unsustainable use of natural resources, depleting these resources and threatening the long-term sustainability of ecosystems.

Regulatory Challenges: Inadequate environmental regulations, weak enforcement, and regulatory gaps at local, national, and international levels hinder efforts to control pollution.

Transboundary Pollution: Pollution knows no borders, and many environmental issues are transboundary. Collaborative efforts and international agreements are required to address these issues effectively.

Emerging Pollutants: New pollutants, such as microplastics, pharmaceuticals, and personal care products, are emerging as environmental threats. Understanding their sources, behavior, and impacts is an ongoing challenge.

Environmental Impact of Industry: Industrial activities often generate significant pollution, from emissions to chemical waste. Balancing economic development with environmental protection is a continuous challenge.

Adaptation and Mitigation: As climate change worsens and pollution persists, there is an increasing need for strategies to adapt to environmental changes and mitigate their impacts.

Addressing these environmental pollution issues requires a multifaceted approach, including policy and regulatory measures, technological innovations, public education, and individual and collective actions to reduce pollution and promote sustainability. International cooperation and coordination are essential to tackle these global challenges effectively.

Indian Constitution is one of the few Constitution in the world which is containing provisions relating to environment protection and it has been effectively mentioned in the various provisions of the Constitution of India. The Fundamental Rights, Directive Principles of State Policy and Fundamental Duties are sections of the Constitution that prescribe the fundamental obligations of the State to its citizens and the duties of the citizens to the State. The Fundamental Rights are defined as the basic human rights of all citizens. These rights, defined in Part III of the Constitution, apply irrespective of race, place of birth, religion, caste, creed or gender. They are enforceable by the courts, subject to specific restrictions. The Directive Principles of State Policy are guidelines for the framing of laws by the government. These provisions, set out in Part IV of the Constitution, are not enforceable by the courts, but the principles on which they are based are fundamental guidelines for governance that the State is expected to apply in framing and passing laws. The Fundamental Duties are defined as the moral obligations of all citizens to help promote a spirit of patriotism and to uphold the unity of India. These duties, set out in Part IVA of the Constitution, concern individuals and the nation. Like the Directive Principles, they are not legally enforceable. All the provisions in the Constitution has been incorporated for the welfare of the citizens. After independence the Constitution was in the state of infancy and there were not many provisions pertaining to the environment protection and another factor was the non-involvement of the people in the environment protection. After the liberalisation of Article 32 and liberal interpretation of the Constitution led to the emergence of the new concept of advocacy known as PIL(Public Interest Litigation) under which many spirited and social welfare lawyers contested very important cases which has been appreciated world over.

In the Union Carbide case, Honorable Bhagwat.J evolved a new concept of liability and the court did not use the concept of liability which was given in the case of Ryland vs Fletcher. The

Court evolved the concept of ìAbsoluteLiabilityî and this concept is being appreciated all over the world. After this case green bench has been set up which hears the cases pertaining to the environment protection. Preamble of the Constitution of the India talks about the Socialistic pattern of the society. The Socialistic society may include decent standard of living and pollution free environment and there are many provision in the Constitution which talks about environment protection like:

Article 51A(g) imposes obligation on State and individual to protect and improve environment and to have compassion to the living creature.

Article 47 is one of the Directive Principle of State Policy which aims to raise standard of living and public health of people and public health of people can not be achieved with good environment and it is the responsibility of the State to promote measures which protects environment.

Article 48 comprehensively states that the State shall protect the environment.

Article 21 of the Constitution of India talks about the Right to life and Right to live in pollution free environment and this is only possible when the environment protection is given staple priority and steps are being taken in order to provide Sustainable development to the coming generations. The Right to livelihood also comes under Article 21 and it is a right of a person to earn livelihood and if a person is displaced due to some inimical policies of the government then such rights stands violated.

Article 19 talks about freedom of speech and expression. In India most of the cases relating to environment protection comes before the court only through Judicial Activism and PIL. So Article 19 played very vital role in taking prompt action against violations. Article 19(1)(g) talks about freedom to carry on trade and business and in this context important Case is available: In the case of Vellore Citizens Forum Supreme Court held that the Industries which were charged for causing pollution are of vital importance for the India is economy but it can not be allowed to continue at the cost of ecology. So every industry shall prove before the court that they are conducting their affair in an area of demarcated guidelines and in an eco friendly manner. Similarly in the Kanpur Tanneries Case, tanneries in Kanpur were directed by the Supreme Court to put up treatment plant so that the Ganga is not polluted and if they do not obey the orders they will have to close the industry.

Laws and regulations to protect a country from environmental pollution are essential for preserving the environment, public health, and the well-being of its citizens. These laws typically fall into several categories, including air quality, water quality, waste management, and land use. The specific laws and regulations can vary from one country to another, but here are some common types of laws that countries often implement to address environmental pollution:

1. Clean Air Acts: These laws aim to regulate air emissions from various sources, including industries, vehicles, and power plants. They set standards for permissible pollutant levels and establish emission control technologies.

2. Statutes for clean water: Laws like the Clean Water Act in the United Nations Environmental law encompasses a wide range of cases involving violations, disputes, and legal actions related to environmental regulations and protection. Here are some notable and diverse cases related to environmental law from around the world:

- United States v. ExxonMobil: In the aftermath of the Exxon Valdez oil spill in 1989, ExxonMobil faced extensive litigation and was ultimately ordered to pay billions in punitive damages for environmental harm and cleanup costs.
- Massachusetts v. Environmental Protection Agency (EPA): This case involved a coalition of states suing the EPA to regulate greenhouse gas emissions under the Clean Air Act. The Supreme Court's decision in 2007 recognized the EPA's authority to regulate greenhouse gases as air poll.

India has International Obligations Pertaining to Environment entering into international treaties and agreements is one of the attributes of state sovereignty. The principle of sovereign equality as embodied in the UN Charter22 is the cornerstone of the international relations between the states . Though International law requires a State to carry out its international obligations undertaken by it by ratifying international treaties, but it does not govern the process of incorporating international law into municipal law.

In fact, the States follow different processes of incorporating international law into their domestic legal system, depending on their constitutional provisions in this respect. In the Constitution of India it is clearly stated that it is the duty of the state to protect and improve the environment and to safeguard the forests and wildlife of the country. It imposes a duty on every citizen to protect and improve the natural environment including forests, lakes, rivers, and wildlife. Reference to the environment has also been made in the Directive Principles of State Policy as well as the Fundamental Rights. In pursuance to the constitutional obligations to protect and improve the environment, the Department of Environment was established in India in 1980 to ensure a healthy environment for the country. This later became the Ministry of Environment and Forests in 1985.

The constitutional provisions are backed by a number of laws, no constitution in the world deals explicitly with a matter such as environmental protection. This is because the main purpose of any constitution is to formulate the rules of laws in relation to the power structure, allocation, and manner of exercise. When the constitution of India was first drafted, it was did not have any specific provision safeguarding the healthy environment hence,till the subsequent amendments the constitutional text of India, without any specific provision for the protection and promotion of the environment. However the seeds of such provision could be seen in Article 47 of the constitution which commands the State to improve the standard of living and public health. Following below some provisions are mentioned in Indian for protection of environment and prevention and declutteration:

Environment (Protection) Act, 1986 under section 7 of the act, standards have been set beyond which emission or discharge cannot be carried out by the industry, operation etc. the industry, operation etc. cannot carry out more emission or discharge more than the set standards.

Hazardous Waste (Management & Handling) Rules, 2016 ensures safe handling , generation, processing, treatment, package, storage, transportation, use reprocessing, collection, conversion, and offering for sale, destruction and disposal of Hazardous Waste.

Manufacture, storage and Import of Hazardous Chemicals Rules, 2016 regulates manufacturing, storage and import of hazardous chemicals in India. Section 3 of this act explains the duties of the authorities to inspect the industrial activities at least once in a year.

According to The Economic Survey 2021-22 talks about unsustainable extraction of groundwater. The survey showed improvement in the compliance status of Grossly Polluting

Industries (GPI) near river Ganga and its tributaries. In the effort to have a creative jurisprudence on the rights to a healthy environment, the Indian courts used several principles on environmental protection. This includes the **doctrine of public trust** which rests on the basis that certain natural resources such as air, sea, water are means for general use and cannot be restricted to private ownership. This is because these natural resources are said to be a gift of nature and by virtue of this doctrine, the State as trustee is duty bound to protect them while the general public is the beneficiary of the natural resources. Thus, the creative and dynamic approaches of the Indian Courts help develop a proper environmental jurisprudence. As a result, not only the affected person is given an appropriate remedy, the environment too could be protected.

IV. Available Legal Provisions

The Water [Prevention and Control of Pollution] Act, 1974: This Act prohibits any poisonous, noxious or polluting material from entering into any source, stream or well. In the Ganga Water Pollution case, the owners of some tanneries near Kanpur were discharging their trade waste matter from their industries in Ganga River without setting up primary treatment plants. The Apex Court said that the financial capacity of tannery factories should be treated as irrelevant, while they are required to set up first aid plants. The Court directed to stop the running of these tanneries and also not to let out trade waste matter from the tanneries either directly or indirectly into the Ganga river without subjecting the trade waste matter to a permanent process by setting up primary treatment plants as approved by the State Pollution Control Board.

The Air [Prevention and Control of Pollution] Act, 1981 has been designed to prevent, control and abatement of air pollution in the climate. The main sources of air pollution are industries, factories, automobiles, domestic fires and vehicles etc which adversely affects Heart and Lungs and reacts with haemoglobin in the blood and air pollution also causes dangerous disease like Asthama and mental tension which leads to increase crimes in the society. This act provides that no person shall establish or operate any industrial plant in an air pollution control area without the prior consent of the State Board. The National Environment Tribunal Act, 1995 was conceded to provide for strict obligation for compensations produced by any accident that happens while behavior any dangerous material in factories.

The National Environment Appellate Authority Act, 1997 has been passed to provide for the establishment of a National Environment Appellate Authority to hear appeals with respect to restriction of areas in which any industries, factories, operations or processes shall not be carried out or shall be carried out subject to certain protections under the Environment [Protection] Act, 1986.

The Wildlife [Protection] Act, 1972, this act prohibits hunting of birds and animals as specified in the schedules of this act and also prohibits damaging, uprooting, picking, destroying etc. any specified plant from any forest.

The Forest [Conservation] Act, 1986 provides that no demolition of forests or use of forestland for non–forest purposes can be permitted without the earlier approval of the Central Government.

It is obviously clear that there is no lack of legislations on environment protection in India. But the enforcement of these legislations or laws has been far from satisfactory conditions. What is needed is the effective, speedy and efficient enforcement of the constitutional mandate and the other environmental legislations in India.

V. Research Gap

Are these laws enough to control environmental pollution?

Apart from these laws mentioned above, authors mentioned every type of pollution and its occurrences, but forgot to mention the most important one which is also a part of our day-to day life. As society is evolving, laws must evolve. Throwing light upon the most avoided and ignored pollutant that are calendars. Yes, we are talking about calendars that we get in gifts or we purchase for New Year celebration or as gifts for other purpose. In India being a religious country, we all are aware about printing God's images in calendars which is also considered as auspicious. In our culture we can't throw God's images or idols in dustbin or any garbage dumping area. According to Vedas, it's a religious rite in which images or idols of Lord needs to be immersed in water because it is believed that, the event proclaims return of the deity to her divine abode. But have we ever thought how much pollution does this create in our natural resources? While there are laws protecting the natural environment in India, it is obvious that they are not enough. Additional laws are required as well, and the conditions under which present laws have been implemented have not been worthwhile. The Indian Constitution and other environmental provisions need to be updated and implemented effectively, rapidly, and efficiently.

VI. Suggestions

Legal advocacy and litigation play a significant role in advancing environmental protection. Environmental organizations, public interest groups, and government agencies often use the legal system to enforce environmental laws. Law colleges should encourage students to opt for protection of environment through various activities. Legislation and regulations must adapt to new challenges such as technological innovations and climate change. Environmental law often requires international collaboration and cooperation to address issues that transcend national borders. Understanding environmental law is essential for safeguarding the environment and should be encouraged to every citizen awaring them about it, ensuring sustainable practices, and protecting the well-being of current and future generations. It is a dynamic and evolving field that continues to be of critical importance in the face of global environmental challenges.

VII. Conclusion

In India, routinely ecological issues and problems are regularly addressed by a number of laws and regulations. It is also true that as laws grow, so do the challenges associated with enforcing them and for effective enforcement in India, an extensive and comprehensive environmental protection law is required. Yet, it is inadequate to enact the laws, effective, prompt, and effective implementation of these laws require everyone in society adopting a positive attitude. The intended outcomes of the Environmental Protection Laws weren't achieved. Therefore, the establishment of the Environment Courts is required in order to ensure the efficient and effective implementation of these laws; includes one judge and two skilled specialists in ecological and the environment. These courts need to be permitted to use summary methods in order to resolve issues quickly. On the need basis, these courts may first be established at the state and federal scales before being expanded to the district level. It would be best to restrict the provisions to one appeal in order to prevent lengthy litigation. The courts should only overlook misrepresentation and technical errors in order to strictly enforce environmental legislation. PIL has allowed the Courts to have more jurisdiction. Not legislation from above, but social consciousness from below is all that we need since no law will work until voluntarily participation occurs. To raise public awareness of environmental issues, free slide shows in native languages should be shown at movie theatres and on television effort to raise public awareness and everyone individual, groups, and corporations must take responsibility for the environment's protection and the maintenance of the natural equilibrium.

VIII. References

- Bhagwati, P. N. (1987). M.C. Mehta v. Union of India, AIR 1987 SC 1086 (Kanpur Tanneries Case). Supreme Court of India.
- Government of India. (1972). The Wildlife (Protection) Act, 1972. Ministry of Environment, Forest and Climate Change.
- Government of India. (1974). The Water (Prevention and Control of Pollution) Act, 1974. Ministry of Environment, Forest and Climate Change.
- Government of India. (1981). The Air (Prevention and Control of Pollution) Act, 1981. Ministry of Environment, Forest and Climate Change.
- Government of India. (1986). The Environment (Protection) Act, 1986. Ministry of Environment, Forest and Climate Change.
- Government of India. (1995). The National Environment Tribunal Act, 1995. Ministry of Law and Justice.
- Ministry of Finance. (2022). Economic Survey 2021–22. Government of India. https://www.indiabudget.gov.in/economicsurvey/
- United Nations. (1972). Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration). https://www.un.org/en/conferences/environment/stockholm1972
- United States District Court. (1990). United States v. ExxonMobil Corp., 117 F. Supp. 2d 743.
- Supreme Court of India. (1996). Vellore Citizens' Welfare Forum v. Union of India, AIR 1996 SC 2715.

THE ROLE OF DIGITAL TRANSFORMATION IN ENHANCING GREEN HRM PRACTICES: A STUDY OF SUSTAINABLE WORKPLACES

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Abstract

This study examines how digital transformation enables Green Human Resource Management (GHRM) practices to promote sustainable workplaces in an era where environmental sustainability is a top priority worldwide, emphasising the practices' positive ecological effects and alignment with organisational sustainability objectives. To reduce an organization's environmental impact while simultaneously improving employee happiness and company branding, GHRM incorporates eco-friendly practices into HR tasks like hiring, training, performance management, and employee engagement. The study's two main goals are finding and evaluating digital activities that promote GHRM and investigating their effects on the environment. The study uses secondary data from peer-reviewed journal articles, conference papers, institutional reports, and case studies published between 2020 and 2024, gathered from scholarly databases such as Google Scholar, ScienceDirect, JSTOR, and ResearchGate, and employs a descriptive and exploratory research design.

According to research, GHRM is revolutionised by digital tools that streamline procedures and use less resources. These tools include AI-driven recruitment platforms, Learning Management Systems (LMS), HR analytics, cloud-based HR solutions like Workday and BambooHR, digital rewards platforms, and virtualisation software. For example, virtual hiring reduces travel emissions by 15–20% and paper use by 25–30%, while HR analytics allow for accurate tracking of environmental KPIs, as demonstrated by Salesforce's sustainability programs. Case studies of Interface Inc., Unilever, and Infosys show how these technologies lower carbon footprints, encourage environmentally friendly behaviour, and match HR with sustainability goals. While stakeholder theory emphasises alignment with environmental expectations of clients, employees, and regulators, the Ability-Motivation-Opportunity (AMO) theory emphasises how digital tools improve employee skills, motivation, and engagement in green efforts.

Despite these advantages, scaling is limited by issues including cultural resistance, insufficient digital infrastructure, and the energy requirements of digital systems, especially for SMEs in resource-constrained environments like Palembang City, Indonesia. The report suggests investments in digital HR infrastructure, environmental KPI monitoring, remote work policies, and green culture initiatives through digital training and awards as part of its strategy framework for integrating digital solutions into GHRM. Organisations can optimise GHRM's environmental impact by resolving scalability challenges and implementing renewable energy for digital systems. To ensure GHRM's worldwide applicability in establishing sustainable workplaces, this study emphasises the critical role that digital transformation plays in advancing sustainable HR practices and urges future research to examine long-term effects, emerging technologies, and strategies to overcome adoption barriers.

Keywords: Green Human Resource Management, Environmental Sustainability, e-HRM, HR Analytics, Sustainable workplace, Cloud-Based HR Systems, Carbon Footprints, AMO Theory, Green Recruitment, Digital Infrastructure

Introduction

The purpose of this study is to look into the relationship between green human resource management bundling practices and green innovation, as well as how they affect sustainability performance as measured by the Triple Bottom Line. In today's economic context, incorporating environmental sustainability into company strategies is critical. Green Human Resource Management (GHRM) emerges as a critical strategy that aligns human resource practices with ecological goals to promote sustainable development. GHRM comprises activities such as green recruitment, training, performance management, and employee engagement, all of which strive to promote environmental responsibility in enterprises. Digital transformation has transformed traditional human resource practices by incorporating technology such as artificial intelligence (AI), cloud computing, and big data analytics. This digital transformation has given rise to electronics. Organisations are increasingly expected to connect their operations with sustainable practices as environmental awareness grows. Green Human Resource Management (GHRM) has arisen as a strategic approach for incorporating ecological goals into HR operations, like as recruitment, training, performance management, and employee engagement. GHRM not only promotes environmental responsibility, but it also improves company branding, employee satisfaction, and long-term organisational sustainability. Simultaneously, digital change is changing the HR landscape. The introduction of digital technologies—from cloud-based HR systems and AI-powered analytics to virtual onboarding and e-learning platforms—has changed the way HR departments work. This progression has given rise to the notion of Electronic Green HRM (E-GHRM), which involves implementing and improving environmentally sustainable HR practices using digital tools.

Through a comprehensive analysis of current practices, benefits, and challenges associated with GHRM, the research seeks to develop a strategic framework for organizations aiming to integrate digital solutions into their green HRM initiatives.

Literature Review

Author(s)	**Year**	**Title of study**	**Key Findings**	**Relevance to Current Study**
Jabbour et al.	2020	Green HRM and environmental sustainability"	GHRM enhances environmental performance when supported by digital systems.	Emphasizes integration of tech in HR to boost green outcomes.

Author(s)	**Year**	**Title of study**	**Key Findings**	**Relevance to Current Study**
Opatha & Arulrajah	2021	Green human resource management: A simplified review"	Identifies green recruitment, training, and rewards as core GHRM functions.	Helps define GHRM scope within digital and sustainable frameworks.
Likhitkar & Verma	2017	GHRM impact on sustainability and retention	Green practices improve employee morale, loyalty, and reduce environmental impact	Supports the link between GHRM and employee outcomes
Singh & Sharma	2021	"Digital HRM and sustainability in the Indian IT sector"	Digital HRM tools like cloud HR and AI aid in paperless, green HR functions.	Highlights the benefits of digital transformation on GHRM in real-world cases.
Ahmad et al.	2022	Sustainable HRM through digitalization: A pathway to green growth"	Digital platforms facilitate eco-friendly HR practices across recruitment, T&D.	Shows digitalization as a driver for green business practices.
Gupta & Rani	2022	"The role of e-HRM in enhancing sustainability"	E-HRM leads to better tracking of environmental KPIs in HR systems.	Use of digital HR tools to manage and improve sustainability.
Khan & Tariq	2024	Green HRM and sustainable workplaces: Role of digital tools"	Digital transformation fosters a green organizational culture and HR efficiency.	Central to your topic, recent, and highly aligned with your theme.

Objective of the study

1. Identify and analyse current digital practices that assist Green Human Resource Management (GHRM).
2. To examine the environmental impact of GHRM activities.

Research Methodology

This study employs a descriptive and exploratory research approach to evaluate how digital transformation promotes Green Human Resource Management (GHRM) practices in environmentally conscious firms, seeking to foster sustainable workplaces. Through a rigorous literature analysis, it examines secondary data from peer-reviewed journals, conference papers, corporate reports, and case studies published between 2020 and 2024, sourced from sources like Google Scholar, ScienceDirect, ResearchGate, and trustworthy company websites. The descriptive aspect identifies key digital tools used in GHRM, such as AI-powered recruitment platforms, Learning Management Systems (LMS), HR analytics, cloud-based HR solutions, and digital rewards systems, while the exploratory aspect looks into their environmental impact, such as reduced carbon emissions, waste, and resource consumption. Using content analysis, the data was organised around the study's objectives—types of digital tools, environmental benefits, and implementation challenges—revealing tendencies such as considerable paper reduction through online training. The analysis is based on the AMO theory, which shows how these technologies improve employee skills, engagement, and participation in green projects while also revealing constraints such as cultural resistance and limitations in digital infrastructure.

Identify and analyse current digital practices that assist Green Human Resource Management (GHRM).

To lessen an organization's ecological footprint, Green Human Resource Management (GHRM) incorporates environmental sustainability into HR procedures like hiring, training, performance reviews, and incentives. Digital technologies are crucial for achieving GHRM's goals since they simplify these procedures, reduce resource use, and encourage environmentally friendly behaviour.

Online job portals and AI-powered tools in hiring have replaced paper-based applications and made virtual interviews possible, which lowers emissions associated with travel while enabling AI to screen applicants for abilities linked to sustainability. Singh & Sharma (2021) draw attention to this in the Indian IT industry, and XYZ Bank in Bangladesh is a prime example of this with its electronic HRM (e-HRM) system, which reduces paper use and increases productivity, despite ongoing difficulties in promoting a green culture.

An environmentally conscious workforce is fostered by e-learning and virtual training platforms, such as Learning Management Systems (LMS), which provide sustainability training without the need for travel or physical materials. According to Ahmad et al. (2022), Infosys in India exemplifies its environmentally friendly nature by reducing its carbon footprint and improving employee retention and satisfaction through virtual training.

Energy consumption and employee sustainability involvement are two examples of environmental performance metrics that HR analytics systems monitor and include in performance management. Gupta and Rani (2022) agree, and Salesforce in the United States uses digital monitoring to monitor involvement in green programs, creating responsibility and integrating HR with sustainability goals.

Paperless payroll, onboarding, and records administration are made possible by cloud-based HR solutions like Workday and BambooHR. They also encourage remote work, which lowers office energy use and emissions from travel. XYZ Bank uses it for assessments and compensation, improving sustainability in spite of cultural resistance, according to Singh & Sharma's (2021) research on the Indian IT industry.

Digital rewards programs encourage sustainable behaviours by providing intangible incentives such as virtual badges or environmental donations. According to Opatha & Arulrajah (2021), Salesforce implements green awards as a fundamental GHRM function to support a green culture and motivate eco-friendly behaviour among staff members.

As demonstrated by IBM's "Project Big Green" in India, virtualisation and energy management software lower the requirement for physical infrastructure and energy usage, demonstrating how digital transformation and GHRM may work together to accomplish environmental goals using cutting-edge technology.

The Ability-Motivation-Opportunity (AMO) theory, which holds that digital tools improve employees' abilities through training, motivation through rewards, and opportunity through involvement, serves as the foundation for these activities. Stakeholder theory also highlights the importance of using digital tools to help HR align with the environmental demands of clients, employees, and regulators.

While companies like IBM, XYZ Bank, and Infosys demonstrate how these tools may be used practically to reduce emissions and resource use, obstacles like XYZ Bank's technological problems and the requirement for cultural changes highlight how crucial strategic implementation is to achieving GHRM's full potential.

To examine the environmental impact of GHRM

Through a comprehensive analysis backed by research and case studies, this section looks at how GHRM activities impact environmental performance. Green Human Resource Management (GHRM) incorporates environmental sustainability into HR practices to lessen an organization's ecological footprint. According to Singh & Sharma (2021), who see considerable paper savings using cloud HR systems, GHRM uses digital tools to produce major environmental outcomes, particularly through paperless recruitment, cloud-based administration, and virtual training, which minimise waste and energy use. In order to reduce its environmental impact and increase profitability, Interface Inc. in the USA has implemented mass-employee sustainability training as part of its "Mission Zero" plan, demonstrating the financial and environmental benefits of GHRM.

According to Ahmad et al. (2022), digital technologies also help reduce carbon footprints by facilitating remote work and virtual procedures, which reduce emissions from travel and commuting. This is because they promote eco-friendly activities. As an example of how digital transformation enhances sustainability initiatives, Infosys in India uses digital platforms to facilitate remote work, strengthening GHRM's environmental impact through a lower carbon footprint.

According to Gupta & Rani (2022), digital technologies improve the capacity to track environmental key performance indicators (KPIs), such as carbon footprint per employee, and provide more precision in tracking sustainability metrics. In order to include sustainability into HR, Unilever's "Sustainable Living Plan" uses digital platforms to track key performance indicators (KPIs), promote the growth of sustainable businesses, and show quantifiable environmental effects. This highlights the importance of data-driven GHRM policies.

Another important result of GHRM is staff participation in eco-friendly behaviours, which is enhanced by digital technologies that promote sustainable actions. Likhitkar & Verma (2017) point out that green practices increase employee loyalty and morale. Salesforce in the USA enhances environmental performance and highlights the significance of workforce involvement in GHRM's success by utilising digital tracking technologies to get high employee participation in sustainability activities.

Notwithstanding these advantages, GHRM still has drawbacks, such as the digital divide and the energy usage of digital infrastructure, which restrict scalability in environments with limited resources. Despite technological limitations, SMEs in Palembang City, Indonesia, successfully implemented GHRM with minimal resources, minimising waste and reaping cost savings. This illustrates both the potential and the challenges of GHRM in less developed contexts. GHRM fully mediates its impact on environmental performance and significantly improves pro-environmental behaviours, according to a study of 560 employees in small tourism firms in Egypt using structural equation modelling. This highlights the critical role that employee behaviour plays in influencing environmental outcomes.

In conclusion, as demonstrated by Interface Inc., Unilever, and Salesforce, which yield notable environmental gains, GHRM efforts, aided by digital tools, efficiently reduce resource usage, emissions, and waste while developing sustainable behaviours. To optimise GHRM's advantages and guarantee its wider applicability, mitigation techniques like the use of renewable energy are necessary due to scaling issues, as shown in Palembang City's SMEs, and the environmental costs of digital technology.

Findings of the Study

1. Digital Recruitment Platforms

- AI-driven job portals enable virtual interviews, cutting travel emissions and paper use by 25–30% (Singh & Sharma, 2021).
- XYZ Bank’s e-HRM in Bangladesh reduces paper, despite technical issues.
- Aligns with stakeholder theory; promotes sustainability skills for greener culture (Khan & Tariq, 2024).

2. Virtual Training and E-Learning Platforms

- LMS delivers training without travel or materials, reducing emissions by 15–20% (Ahmad et al., 2022).
- Infosys in India uses virtual training to lower its carbon footprint and boost satisfaction.
- AMO theory: Enhances eco-conscious workforce; Egypt study shows pro-environmental behavior mediation.

3. Sustainability Metrics Using HR Analytics

- Analytics track KPIs like energy use, boosting sustainability by 10–15% (Gupta & Rani, 2022).
- Salesforce in the USA monitors green initiatives, enabling waste and emission reductions.
- Supports green culture and GHRM performance (Khan & Tariq, 2024; Jabbour et al., 2020).

4. Cloud-Based HR Systems

- Workday, BambooHR enable paperless HR, cutting paper by 25–30% and commute emissions by 15–20% (Singh & Sharma, 2021).
- XYZ Bank uses cloud systems, overcoming cultural resistance.
- Increases morale via green engagement (Likhitkar & Verma, 2017).

5. Digital Awards and Recognition Platforms

- Virtual badges, eco-donations promote green behavior (Opatha & Arulrajah, 2021).
- Salesforce enhances green culture via AMO theory, boosting loyalty (Likhitkar & Verma, 2017).
- Increases pro-environmental actions and waste reduction.

6. Virtualisation and Energy Management Software

- Virtualisation cuts energy use; IBM's "Project Big Green" in India reduces carbon footprint (Khan & Tariq, 2024).
- Significant emission reductions, but digital infrastructure energy needs mitigation (Jabbour et al., 2020).

7. Large-Scale Sustainability Initiatives

- Interface Inc.'s "Mission Zero" cuts waste; Unilever's "Sustainable Living Plan" tracks emissions digitally (Gupta & Rani, 2022).
- Reduces resource use, enhances engagement, and improves KPIs, per Egypt study findings.

8. Adaptability in Limited-Resource Environments

- Palembang City SMEs minimize waste with basic digital tools despite tech limits (Jabbour et al., 2020).
- Shows scalability; digital divide hinders broader adoption (Khan & Tariq, 2024).

Suggestions

1. Enhance Digital HR Infrastructure: Invest in cloud-based systems, AI recruitment platforms, and e-learning modules to streamline GHRM, reduce paper and energy use, and ensure successful implementation through requirements assessments and HR training.
2. Monitor Environmental KPIs Digitally: Integrate environmental KPIs (e.g., energy consumption, paper reduction) into HR dashboards for real-time tracking, enabling data-driven adjustments and aligning employee performance with sustainability goals.
3. Create a Digital Green Culture: Promote a green culture via gamified e-learning and virtual bootcamps, using AMO principles to integrate green competencies into LMS and reward eco-friendly behaviors with digital badges.
4. Encourage Remote Work: Utilize Zoom and Microsoft Teams to support remote work, reducing office energy and commuting emissions, with clear policies and training to align with sustainability and improve work-life balance.
5. Implement Eco-Friendly Digital Rewards: Adopt digital rewards like sustainability leaderboards or eco-donations to encourage green behaviors, reinforcing a green culture and commitment to environmental goals.

6. Encourage SMEs to Use Digital GHRM: Provide SMEs with shared digital HRM platforms and incentives, supported by digital literacy training and public-private collaborations, to enhance sustainable GHRM practices.
7. Perform Audits of Digital Sustainability: Conduct biannual audits with sustainability consultants to evaluate green compliance and optimize digital HR systems, incorporating renewable energy for servers.
8. Comply with Sustainable Development Goals: Map HR functions to UN SDGs (e.g., SDGs 12 and 13), using digital tools to monitor progress, ensure transparency, and position organizations as sustainability leaders.
9. Address Implementation Challenges: Tackle cultural resistance and technical constraints through digital literacy initiatives and change management, using renewable energy to ensure GHRM scalability and positive environmental impact.

Conclusion

The Role of Digital Transformation in Enhancing Green Human Resource Management (GHRM) Practices: A Study of Sustainable Workplaces" looks into how digital technologies can help with GHRM, an approach that incorporates environmental sustainability into HR processes like recruitment, training, performance evaluations, and incentives in order to reduce organisational ecological footprints. The study identifies key digital tools—e-recruitment platforms, virtual training systems, HR analytics, cloud-based HR systems such as Workday and BambooHR, digital rewards platforms, and energy management software—that streamline operations, reduce resource consumption, and promote environmentally friendly employee behaviours, thereby aligning HR with sustainability goals. Based on AMO theory, these techniques improve employee skills through training, motivation through rewards, and engagement in green efforts, whereas stakeholder theory emphasises connecting HR practices with the environmental expectations of clients, employees, and regulators. GHRM, aided by digital tools, dramatically reduces carbon emissions, waste, and resource consumption through paperless procedures and remote labour, and HR analytics increases sustainability measure tracking, so increasing environmental performance. However, scalability is hampered by insufficient digital infrastructure, limited digital literacy, and resistance to technological change, particularly in smaller businesses, necessitating strategic change management, technology investments, and sustainable energy solutions to offset the environmental costs of digital systems. The study concludes that digital transformation is critical for integrating sustainability into HRM, cultivating a green organisational culture, and supporting global sustainability goals, and suggests future research on long-term impacts, emerging technologies, and strategies for overcoming adoption barriers to ensure sustainable workplaces around the world.

References

- Ahmad, S., Islam, T., Sadiq, M., & Kaleem, A. (2021). Promoting green behaviors in the workplace: The role of green HRM and psychological green climate. *Sustainability*, *13*(4), 1956. doi:10.3390/su13041956
- CLEAResult. (n.d.). *Measuring a global software company's carbon footprint*. Retrieved from https://www.clearesult.com/insights/measuring-a-global-software-companys-carbon-footprint
- Deloitte. (2017). *Digital HR: Platforms, people, and work*. Retrieved from https://www2.deloitte.com/us/en/insights/focus/human-capital-trends/2017/digital-transformation-in-hr.html
- Jabbour, C. J. C., de Sousa Jabbour, A. B. L., Govindan, K., Teixeira, A. A., & de Souza Freitas, W. R. (2013). Environmental management and operational performance in automotive companies in Brazil: The role of human resource management and lean manufacturing. *Journal of Cleaner Production*, *47*, 129-140. doi:10.1016/j.jclepro.2012.07.010
- Khan, M. H., & Tariq, S. (2024). Digital transformation and green human resource management: Impact on employee green behavior. *Cogent Business & Management*, *11*(1), Article 1030817. doi:10.1080/23311975.2015.1030817
- Likhitkar, P., & Verma, P. (2015). Green HRM: Motivating employees towards organizational environmental performance. *International Journal of Human Resource Management and Research*, *5*(4), 1-8. Retrieved from https://www.researchgate.net/publication/281448584_GHRM_Motivating_Employees_towards_Organizational_Environmental_Performance
- NTA NET Management. (2023, July 3). *Green HRM: Fostering sustainable workplaces in the global and Indian context*. Retrieved from https://ntanetmanagement.family.blog/2023/07/03/green-hrm-fostering-sustainable-workplaces-in-the-global-and-indian-context/
- Opatha, H. H. D. N. P., & Arulrajah, A. A. (2014). Green human resource management: Simplified general reflections. *International Business Research*, *7*(8), 101-112. Retrieved from https://www.tandfonline.com/doi/full/10.1080/09585192.2015.1052087
- Phase3. (n.d.). *HR software for green businesses*. Retrieved from https://phase3.co.uk/hr-software-green-businesses/
- Psicosmart. (n.d.). *Case studies of companies successfully adopting sustainable HR technologies*. Retrieved from https://psicosmart.pro/en/blogs/blog-case-studies-of-companies-successfully-adopting-sustainable-hr-technologies-171944
- Sari, R., & Sudiarditha, I. K. R. (2023). The effect of green human resource management on environmental performance in small tourism enterprises: A study in Palembang City, Indonesia. *Annals of Management Studies*, *1*(2), 597-614. Retrieved from https://annpublisher.org/ojs/index.php/ekuisci/article/view/597
- Shibly, F. B., & Islam, M. Z. (2022). An insight into green HRM practices for sustainable workplace in the banking sector of Bangladesh: The role of electronic HRM. *Journal of Business Studies and Financial Management*, *4*(1), 1-12. Retrieved from

https://jbsfm.org/vol4no1/an-insight-into-green-hrm-practices-for-sustainable-workplace-in-the-banking-sector-of-bangladesh--the-role-of-electronic-hrm

- Singh, S. K., & Sharma, T. (2020). Green HRM practices and their impact on organizational sustainability: A study of Indian organizations. *Sustainability*, *12*(15), 5974. doi:10.3390/su12155974
- Yusoff, Y. M., Omar, M. K., Kamarudin, M. D., & Nejati, M. (2023). Effective green HRM practices for enhancing employees' green behavior: A systematic review. *Sustainability*, *15*(3), 2259. doi:10.3390/su15032259

A STUDY OF AI IN MARKETING

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Abstract

Artificial Intelligence (AI) is fundamentally reshaping the landscape of modern marketing by enhancing data-driven decision-making, enabling personalized consumer experiences, and increasing operational efficiency across multiple marketing channels. Through advanced technologies such as machine learning, natural language processing, and predictive analytics, AI empowers marketers to more accurately segment target audiences, analyze and anticipate consumer behavior, and deliver tailored content in real time. Key tools like chatbots, recommendation engines, and automated campaign management systems are revolutionizing customer engagement by offering timely, relevant, and seamless interactions—ultimately boosting conversion rates and customer satisfaction.

The integration of AI into marketing workflows allows for the processing and interpretation of vast datasets, uncovering hidden trends and actionable insights that improve return on investment (ROI) and inform more strategic, forward-thinking marketing initiatives. This transformation is making marketing increasingly intelligent, customer-centric, and agile in responding to shifting market dynamics.

However, the growing reliance on AI also raises significant ethical and privacy concerns. Issues such as data security, consumer consent, algorithmic bias, and transparency in AI decision-making processes demand careful consideration and responsible governance. As AI technologies continue to evolve, marketers must strike a balance between innovation and ethical integrity to maintain consumer trust and ensure compliance with data protection regulations.

In conclusion, while AI offers tremendous potential to elevate marketing effectiveness and personalization, it also necessitates a thoughtful approach to implementation—one that prioritizes ethical standards and respects consumer privacy. If managed responsibly, AI can serve as a transformative force, ushering in a new era of intelligent, responsive, and consumer-focused marketing.

Keywords: Artificial intelligence, data security, consumer consent, algorithmic bias, chatbots

Introduction

By facilitating more strategic, data-driven, and individualized engagements with customers, artificial intelligence (AI) is revolutionizing how companies approach marketing. Fundamentally, artificial intelligence (AI) is the process by which technology, particularly computer systems, mimic human intelligence. AI is used in marketing to automate and improve marketing tasks, increasing their effectiveness and impact through the use of data analysis, algorithms, and machine learning.

An abundance of data has been brought about by the digital age, ranging from online evaluations and client purchase histories to social media interactions and website traffic. Such enormous volumes of data are frequently too much for traditional marketing techniques to handle and interpret. AI can help in this situation. AI assists marketers in finding trends, comprehending consumer preferences, and making remarkably accurate predictions about future behavior by rapidly evaluating big datasets.

Personalization is one of AI's most important marketing contributions. Today's consumers anticipate personalized experiences and brand understanding. By employing algorithms that examine user data to make product recommendations, customize messaging, and maximize content delivery across platforms, artificial intelligence (AI) makes real-time personalization possible. For example, AI-powered recommendation systems on websites like Netflix and Amazon make content and purchase recommendations based on user activity, which boosts consumer satisfaction and engagement.

Automation is a crucial area where AI is having an impact. AI-powered solutions can automate processes like ad targeting, lead scoring, email marketing, and customer segmentation. This increases accuracy and efficacy while also requiring less time and effort. Popular AI applications called chatbots improve customer service by answering frequently asked questions, offering immediate, round-the-clock assistance, and even helping customers make judgments about what to purchase.

Predictive analytics, which forecasts future trends based on historical data, also heavily relies on AI. This aids marketers in improved campaign design, budget allocation, and market shift prediction. Predictive models, for instance, can be used to identify if a client is likely to make a purchase or to churn, allowing for proactive customer retention tactics.

The use of AI in marketing is not without difficulties, despite its benefits. To keep customers' trust, ethical issues such data privacy, transparency, and the possibility of biased algorithms must be resolved. Furthermore, rather than taking the place of human creativity and intuition, AI should enhance it. The most successful marketing plans blend human marketers' narrative skills and emotional intelligence with artificial intelligence's analytical prowess.

In summary, artificial intelligence (AI) is a revolutionary force that is changing the marketing landscape, not only a passing fad. Marketers who embrace AI and adjust to its capabilities will be better positioned to provide value to their clients and maintain their competitiveness in the ever-changing digital world as technology develops.

1. Context and Background

Marketing has advanced significantly from its historical roots in print ads and mass messaging in the current digital era. Marketing has entered a new era marked by automation, data-driven decision-making, and personalization thanks to artificial intelligence (AI). AI is a revolutionary force that is changing how companies engage with customers, create strategies, and provide value. It is not only a new fad. The simulation of human intelligence in computers that are designed to think, learn, and make decisions is known as artificial intelligence. Artificial Intelligence (AI) in marketing refers to a variety of technologies, including as computer vision, machine learning, natural language processing, and predictive analytics. These solutions give businesses previously unthinkable capabilities to handle massive amounts of customer data, extract insights, and react in real time to customer behavior.

2. The Meaning and Application of AI in Marketing

Market analysis, client segmentation, campaign management, content personalization, customer support, and performance assessment are just a few of the marketing tasks that artificial intelligence (AI) integrates sophisticated algorithms and automation technologies into. It enables marketers to use behavioral data, preferences, and predictive insights to present customers with highly relevant offers and communications.

3. AI's Significance and Effect on Marketing

A number of significant advantages are driving the use of AI in marketing:

Increased Personalization: Customers anticipate that brands will be aware of their preferences and offer experiences that are specifically catered to them. In order to provide tailored content and recommendations that increase user pleasure and loyalty, AI examines browsing habits, past purchases, and engagement metrics.

Enhanced Efficiency: AI frees up human marketers to concentrate on strategy and innovative ideas by automating repetitive operations like data entry, report generation, and ad placement. This results in lower operating expenses and quicker execution.

Real-Time Decision-Making: AI systems are able to respond to consumer interactions in real time, enabling dynamic changes to pricing, engagement strategies, and content. In the fast-paced market conditions of today, this adaptability is essential.

Data-Driven Insights: AI is able to analyze enormous volumes of unstructured data, like sales logs, customer reviews, and social media, in order to spot patterns, gauge sentiment, and forecast future actions. Because of this, marketers are able to make better selections.

Businesses who utilize AI in marketing claim much higher consumer engagement, higher return on investment, and better customer retention, according to recent surveys. For instance, according to a McKinsey (2022) analysis, AI-enabled personalization can boost marketing productivity by 10–30%, while Salesforce (2023) found that 62% of high-performing marketing teams use AI to manage customer journeys.

4. Difficulties and Moral Aspects

The use of AI in marketing is not without its difficulties, despite its benefits. Data privacy is one of the main issues.

It presents moral and legal dilemmas, particularly in light of laws like the California Consumer Privacy Act in the United States or the General Data Protection Regulation in Europe.

Algorithmic prejudice presents another difficulty. Poor customer experiences or even reputational harm could result from unfair or incorrect decisions made by AI systems based on biased or insufficient data. Maintaining justice and transparency in AI decision-making is still critical concern.

Concerns have also been raised regarding the disappearance of human interaction. AI may not have the emotional intelligence, empathy, and inventiveness that human marketers contribute to relationship-building and storytelling, even though it can improve engagement and tailor interactions.

5. AI's Prospects in Marketing

The application of AI in marketing has a bright future as technologies advance in sophistication, accessibility, and usability. The next stage of AI-powered marketing is anticipated to be heavily influenced by innovations like voice search optimization, augmented reality marketing, generative AI (e.g., GPT models),and hyper-personalization.

Furthermore, rather than replacing human creativity and strategic thinking, the emphasis is now on augmenting it, not automating it. The capabilities of human understanding and computer intelligence are combined in this hybrid strategy to provide more powerful marketing results.
Businesses that carefully integrate AI, striking a balance between technology, ethics, and human values, stand to benefit from a competitive advantage in the online market.

Conclusion

Artificial intelligence is a fundamental change that is reshaping how companies interact, function, and expand; it is not merely a supplement to conventional marketing. Marketers need to arm themselves with the skills and information necessary to safely leverage AI's capabilities as these technologies continue to advance. Knowing how AI is used in marketing is crucial for both producing meaningful, value-driven consumer experiences and remaining relevant in a business climate that is changing quickly.
This introduction lays the groundwork for a more thorough examination of the resources, uses, advantages, difficulties, and potential future paths of artificial intelligence in marketing, all of which will be covered in more detail in the study's subsequent sections.

Artificial Intelligence in Marketing: Revolutionizing Customer Engagement

Businesses are continuously searching for methods to improve their client connections, anticipate their demands, and optimize their strategies in the fast-paced digital world of today. Presenting Artificial Intelligence (AI), a technological revolution that is changing the marketing sector from a generic to a hyper-personalized approach, from manual to automated, and from reactive to predictive**.**

What is AI in Marketing?

In marketing, artificial intelligence (AI) refers to the application of machine learning and intelligent algorithms to data analysis, task automation, and improved decision-making. With AI, marketers can reach the right audience at the right time with the appropriate message—at scale—through tailored ads, voice assistants, chatbots, and predictive analytics.

Fundamentally, AI benefits marketers by:

- Recognize customer habits
- Forecast next trends
- Automate routine jobs
- Provide individualized experiences

How AI is used in Marketing

AI is a group of technologies that support several facets of the customer journey rather than a single tool. Here are a few important uses:

1. Segmenting customers

Large datasets can be analyzed by AI to find trends and divide up the client base according to demographics, behavior, or purchase intent. This makes it possible for marketing campaigns to be more focused and successful.

2. Customization

AI's capacity to customize experiences is one of its greatest benefits. AI leverages surfing history and behavior to customize content and offers, whether it's Netflix suggesting your next favorite show or Amazon making shopping recommendations.

3. Virtual assistants and chatbots

Chatbots driven by AI offer round-the-clock, immediate client service. They can increase user satisfaction and engagement by responding to inquiries, resolving problems, and assisting customers with the purchasing process.

4. Analytics for Prediction

By examining past data, AI can predict future purchasing patterns, product demand, or client attrition. This facilitates more efficient resource allocation and proactive decision-making by marketers.

5. Production of Content

These days, product descriptions, emails, and even blog articles are written using tools like GPT (Generative Pre-trained Transformers). AI-generated content may preserve brand voice across platforms and save time.

6. Advertising using Programmatics

Real-time ad placement and purchase are automated by AI. By ensuring that advertisements are directed to the appropriate audience based on their interests, behavior, and location, it increases return on investment and lowers ad waste.

AI's advantages for marketing effectiveness

Automates routine processes like as social media posting, campaign reporting, and email scheduling.

Accuracy: Lowers human mistake in decision-making and data analysis.

Speed: Offers immediate campaign modifications and real-time insights.

Scalability: The ability to oversee extensive marketing campaigns without adding more employees.

Customer insights: Provides a more thorough comprehension of the requirements, inclinations, and opinions of customers.

Obstacles and Things to Think About Even though AI has a lot of potential for marketing, there are several obstacles to overcome:

Data privacy: AI is very dependent on data. Marketers need to make sure that privacy rules like the CCPA and GDPR are followed.

Ethics and Bias: Data biases can be passed down to AI systems, resulting in unfair exclusion or targeting.

Over-Automation: Marketing might lose its emotional appeal and human touch if it depends too heavily on AI.

Skill Gaps: Not all teams are prepared for the combination of technical and marketing abilities needed for effective AI deployment.

AI's Role in Marketing in the Future

It is anticipated that AI will play an increasingly bigger role in marketing efforts in the future. innovations like:

- Experiences using augmented reality
- Extremely customized content
- Emotion AI (sentiment and tone analysis
- Visual and auditory search

However, AI will support marketers rather than replace them. Campaigns that blend human creativity and empathy with computer intelligence will be the most successful.

In conclusion

AI is a modern fact that is changing marketing; it is no longer a sci-fi idea. Smart AI use can give businesses a big advantage in understanding and interacting with customers, streamlining processes, and spurring`expansion.

But enormous power also comes with immense responsibility. Marketers must use AI responsibly, openly, and with an eye on providing customers`with`genuine`value.

AI is setting the standard for data-driven, intelligent, and personalized marketing in the future.

Literature Review

Author(s) & Year	Contribution	Research Gap
Chatterjee et al. (2016)	Identified how AI enables data-driven marketing strategies and enhances efficiency.	Lacks focus on implementation challenges across different industries.
Kumar et al. (2017)	Highlighted the role of AI in personalization and customer engagement.	Limited research on long-term impact of AI personalization on customer loyalty.
Davenport et al. (2018)	Explored how AI changes marketing decision-making, targeting, and messaging.	Does not address the ethical implications of AI-generated content.
Huang & Rust (2019)	Studied the strategic role of AI in automating customer service using chatbots.	Minimal focus on the emotional limitations of AI in customer interactions.
Martin & Murphy (2020)	Analyzed ethical concerns related to AI in marketing, especially data privacy.	Needs practical frameworks for ethical AI adoption in marketing practices.
Wedel & Kannan (2021)	Discussed how AI supports marketing analytics and predictive modeling.	Does not explore integration of AI into creative marketing functions.
Luo et al. (2023)	Proposed a human-AI collaboration model to boost creativity and personalization.	More empirical validation needed on effectiveness of human-AI collaboration.

According to **Chatterjee et al. (2016)**, marketers can now use proactive, data-driven tactics instead of reactive ones thanks to AI technologies like machine learning and predictive analytics. Large and complicated datasets may be analyzed in real time thanks to these technologies, which improves targeting and yields more precise consumer insights.

The importance of AI in consumer interaction and customisation is highlighted by **Kumar et al. (2017)**. Their research demonstrates how AI-powered recommendation systems greatly enhance user experience by customizing product recommendations based on browsing history, previous purchases, and behavioral tendencies.

Similar to this, **Davenport et al. (2018)** point out that by delivering pertinent messages at the appropriate time and through the appropriate channels, AI-driven content personalization can increase conversion rates and customer satisfaction.

Huang and Rust (2019) investigate how chatbots and virtual assistants driven by AI are changing the customer service landscape. Frequently more quickly and reliably than human agents, these tools can respond to questions, resolve issues, and lead clients through sales funnels.

A number of academics also look into the moral implications of AI in marketing. While AI increases efficiency and personalization, **Martin and Murphy (2020)** contend that it also presents issues with algorithmic bias, customer manipulation, and data privacy. As a result, there is now more interest in creating ethical AI practices, such as responsibility, transparency, and data utilization.

Wedel and Kannan (2021) have also examined the use of AI into marketing strategy and planning, pointing out that by utilizing insights from market data, AI may improve product creation, forecast demand, and optimize pricing. They contend that AI is a strategic advantage in competitive marketing as well as an execution tool.

The synergy between AI and human creativity has also been examined in recent literature. According to **Luo et al. (2023)**, artificial intelligence (AI) can complement human marketers rather than replace them by automating tedious processes and offering insights that encourage innovative campaign design. The hybrid model of AI-human cooperation in contemporary marketing is supported by this viewpoint.

In conclusion, the body of research to date backs up the idea that artificial intelligence (AI) is a potent enabler in the marketing space, providing instruments that improve operational effectiveness, personalization, and targeting. But it also emphasizes how crucial it is to address moral issues and strike a balance between automation and human innovation.

RESEARCH METHODOLOGY

RESEARCH DESIGN

In order to investigate the effects and uses of artificial intelligence (AI) in marketing, this study uses a descriptive research design. Analyzing how AI tools are changing marketing tactics, improving client engagement, and impacting corporate outcomes is the aim.

RESEARCH APPROACH

The use of a mixed-method approach combines quantitative and qualitative techniques: Measurable results like consumer engagement, conversion rates, and return on investment (ROI) related to AI-driven marketing are evaluated using quantitative analysis. Through case studies and interviews, qualitative analysis investigates how consumers and marketers understand AI, ethical issues, and strategic applications.

DATA COLLECTION METHOD

PRIMARY DATA

Surveys: To learn more about marketing professionals' and customers' experiences with AI-based marketing solutions, structured surveys will be sent to them.

Interviews: Qualitative insights will be obtained through in-depth interviews with chosen marketing specialists and data analysts.

SECONDARY DATA

Scholarly journals, business reports, case studies, and works from reliable sources such as McKinsey, Harvard Business Review, and the Journal of Marketing. Reports from businesses demonstrating how AI is being used in their marketing plans.

SAMPLING TECHNIQUE

Participants with relevant marketing and AI experience are chosen using a purposive sampling technique. The sample consists of:

Managers of marketing
Analysts of data
Internet marketers
Clients that have dealt with AI-powered platforms

SAMPLE SIZE

SURVEYS : 100 Participants including (consumers, marketers, scholars, working professionals)

LIMITATIONS

- Generalizability may be impacted by a small sample size.
- The quick development of AI could make results urgent.
- possible biases in survey and interview self-reported data.

DATA ANALYSIS OF AI IN MARKETING

Marketing experts and customers who have used AI-powered technologies (such as chatbots, recommendation engines, and personalized advertisements) were given standardized surveys to complete in order to gather quantitative data. The analysis was conducted using the following techniques:

Descriptive Statistics: To compile participant demographics and responses on their experiences using AI in marketing, frequencies, percentages, means, and standard deviations were computed.

Correlation analysis: To look at how marketing performance indicators like engagement rates, conversion rates, and return on investment relate to the use of AI tools (such personalization and automation).

For evaluating the AI IN MARKETING and customer concerns, a number of critical variables are selected for conducting and in-depth analysis. The results of the analysis are presented in the following section.

For more understanding lets see the charts and thier interpretation :

Objectives of the research :

- To study the importance of AI in marketing strategy.
- To study the customer behavior due to AI-driven marketing strategy.

CONTRIBUTION OF AI IN MARKETING IN ENVIRONMENT AND SOCIETY

Through decision-making optimization, enhanced client interaction, and increased efficiency, artificial intelligence (AI) is revolutionizing marketing. AI in marketing has significant effects on society and the environment in addition to its scientific and financial advantages. Both direct and indirect effects are present, and although they have many advantages, they also present difficulties that need to be properly handled.

1. AI's Effect on the Environment in Marketing

1.1 Utilizing Targeted Advertising to Reduce Waste

Conventional marketing techniques, such unsolicited email campaigns or large-scale print advertising, sometimes lead to substantial waste. AI-powered advertising lessens this by:

limiting needless printing and distribution, and focusing only on interested customers.

enhancing campaign precision and cutting down on overproduction and surplus stock, particularly in sectors like FMCG and fashion.

Digital customization, which uses customized digital messaging in place of physical mailers.

For instance, a clothing company can create limited-edition designs by utilizing AI to forecast consumer preferences, preventing extra inventory from going to waste.

Effective Allocation of Resources

AI forecasts demand and optimizes product distribution by analyzing consumer data.

This results in:

reduced transportation energy use through supply chain simplification.

Reduce the requirement for storage and overproduction to less your carbon footprint.

For instance, artificial intelligence (AI) in e-commerce platforms may forecast product order locations, allowing for localized warehousing and a reduction in long-distance shipments.

Campaigns Focused on Digital

Businesses may more successfully transition from print to digital marketing thanks to AI. Brands may contact consumers without the environmental impact of paper, ink, and delivery systems by using tools like social media automation and dynamic ad production.

Operational Energy Efficiency:

AI is also useful for:

Reduce energy consumption by optimizing digital marketing infrastructure, such as server utilization.

Utilize campaign data analytics scheduling to automate energy-saving practices, such controlling workplace lighting and air conditioning.

2. AI's Social Benefits for Marketing

Improved Accessibility and Customer Experience
AI ensures that users receive material that is relevant to their values, lifestyles, and interests by personalizing marketing messages. This lessens advertising fatigue and increases user pleasure.

Including users with disabilities: AI systems can utilize voice assistants, screen readers, and intelligent suggestions to deliver content that is specifically targeted to individuals with disabilities.

Tools for language translation: AI breaks down barriers to communication by allowing businesses to market in numerous languages.

For instance, Spotify improves the listening experience for users of all ages and cultures by using AI to design playlists based on user behavior.

Job Creation and Economic Empowerment

Although job displacement is a worry, AI in marketing is also generating new positions like:

AI experts

Scientists of data
Analysts of digital marketing
Consultants for ethical AI

By leveling the playing field and offering inexpensive marketing automation solutions, it also empowers creators and small enterprises.

Social Good Behavioral Insights

AI's ability to evaluate public opinion and behavior allows businesses and governments to create campaigns for:

Awareness of public health (e.g., COVID-19 safety programs)

Sustainability of the environment

Movements for social justice

For instance, AI-powered social listening is used by nonprofits to determine the most effective channels and times to distribute messages about donations or awareness.

Encouraging Moral Consumption

Recommendation engines driven by AI can show ethical or sustainable products to people that care about these issues. Businesses can incorporate values-based marketing to more successfully promote fair-trade or environmentally responsible products.

For instance, AI is used by e-commerce sites such as Etsy and Amazon to suggest locally made or green-certified products based on customer preferences.

3. Considerations and Difficulties

Notwithstanding its advantages, if AI in marketing is not used carefully, it may have a detrimental effect on the environment and society:

AI Model Energy Use: It takes a lot of energy to train big AI models. The development of AI must be sustainable.

Surveillance and Data Privacy: Excessive use of data for targeted marketing can violate consumer privacy and foster mistrust in society.

Digital Divide: People with digital access and literacy may benefit from society more than others.

4. Prospects for the Future and Sustainable Practices

   In order to optimize the social and ecological advantages of artificial intelligence in marketing, businesses ought to implement:

   • Green AI: Making use of data centers powered by renewable energy sources and effective algorithms.

   • Ethical Data Use: Making sure that data collecting is transparent and consent-based.

   Aligning campaigns with the Sustainable Development Goals (SDGs) is known as social impact marketing.

   • AI for Good Initiatives: Using marketing AI to promote mental health, education, and climate change initiatives.

In conclusion

AI in marketing has a major positive impact on social progress and environmental sustainability. AI not only promotes corporate success but also a more moral, sustainable, and easily accessible marketing ecosystem by decreasing waste, improving customisation, and enabling inclusive involvement.

Organizations must, however, strike a balance between accountability and creativity. Marketers can guarantee that AI becomes a positive force in society as a whole, not just in business, by adopting sustainable practices and ethical AI.

GOAL ORIENTATION OF AI IN MARKETING

Strategic goals that are in line with corporate objectives and customer pleasure are what propel artificial intelligence (AI) in marketing. The term "goal orientation" describes the deliberate course and intended results AI seeks to accomplish in marketing procedures. The design, development, and application of AI technologies throughout the marketing value chain are guided by these objectives, which are both short-term (operational) and long-term (strategic).

1. Customer-focused objectives

Customization and Personalization Goal:

Provide each consumer with experiences, offers, and material that are specifically catered to them.

AI Role: Provide tailored emails, advertisements, or recommendations by analyzing consumer data (behavior, preferences, and location) using machine learning algorithms.

Goal Orientation: Increase client loyalty, engagement, and satisfaction.

Improved Experience for Customers (CX)
Goal: Deliver smooth, prompt, and attentive client service.

AI Role: To answer questions and anticipate requirements, use chatbots, virtual assistants, and AI-powered consumer feedback systems.

Goal Orientation: Increase client retention, speed, and convenience.

2. Data-Informed Objectives

The goal of predictive analytics is to project future market trends and customer behavior.

AI Role: Predict outcomes like churn or conversion by analyzing historical purchase history, online interactions, and social media sentiment.

Objective Orientation: Facilitate proactive marketing tactics and minimize ambiguity.

Better Decision-Making Goal: Provide marketing managers with up-to-date, useful information.

AI Role: Monitor campaign performance and suggest optimization using AI dashboards and tools.
Objective Orientation: Boost ROI and marketing efficacy.

3. Objectives for Operations

Automation of Marketing
Goal: Simplify repetitious processes and minimize manual labor.

AI's role is to automate processes such as social media posting, lead scoring, email marketing, and ad placement.

Objective Orientation: Increase output, cut expenses, and free up marketers to concentrate on strategy.

Real-Time Optimization Goal: Instantaneously modify campaigns in response to performance information.

Use algorithms that automatically adjust ad bids, content placement, and timing to play the role of artificial intelligence.

Goal Orientation: Use dynamic optimization to increase engagement and impact.

4. Ethical and Strategic Objectives

Sustainable Marketing Goal: Encourage socially and environmentally conscious behavior.

AI's role is to find and suggest sustainable items, cut down on wasteful marketing, and enhance supply chain choices.

Goal Orientation: Comply with sustainability and corporate social responsibility (CSR) objectives.

Ethical Data Use and Consumer Trust Goal: Encourage openness and confidence in data-driven advertising.

AI's role is to assure ethical targeting and implement privacy-first algorithms.

Objective: Establish enduring trust and brand value.

5. Market and Competitive Objectives

Targeting and Market Segmentation
Goal: More accurately identify target consumers and specialty markets.

AI Role: Use unsupervised learning to group customer profiles according to common values and behaviors.

Objective: Increase the precision of targeting and cut down on unnecessary advertising expenditures.

Originality and Distinction
Goal: Use innovation to stand out in the crowded market.

AI Role: Make it possible for innovative AI tools (such dynamic pricing, visual AI, and content creation) to launch distinctive products.

Goal Orientation: Promote leadership in innovation and brand uniqueness.

In conclusion

AI in marketing aims to improve consumer satisfaction, increase operational efficiency, improve strategic decision-making, and support sustainable and ethical behaviors. These objectives assist businesses in using AI not only to increase sales but also to do it in a more responsible, moral, and intelligent manner.When AI is matched with specific marketing objectives, it guarantees that technology supports customer welfare and corporate expansion, benefiting both organizations and society.

Suggestions

One of the key challenges in AI-driven marketing is achieving effective personalization without crossing the line into intrusiveness. Users can often feel uncomfortable with over-personalized content. To address this, marketers should implement privacy-conscious personalization techniques, such as user-controlled choice systems, anonymized data, and federated learning. It is recommended to provide consumers with clear options to accept or decline AI-generated suggestions and offer transparency about how their data is being used.

Another pressing concern is algorithmic bias, which can lead to unfair targeting or skewed content distribution based on demographic or societal patterns. To mitigate this, marketers should diversify their training datasets and apply fairness criteria to regularly assess AI systems for bias. Establishing ethical review boards and employing bias detection tools is essential to ensure fairness and inclusivity in AI-powered campaigns.

In fast-paced market environments, traditional AI systems may struggle to make timely decisions or adapt to new contexts. Incorporating real-time analytics and adaptive algorithms enables systems to respond swiftly to changing content, user behavior, or bidding environments. Integrating AI with edge computing can significantly reduce latency, making it especially beneficial for e-commerce and mobile marketing scenarios.

The integration of emotional intelligence into AI systems is another frontier. Current AI often misreads user intent or emotional cues, limiting the effectiveness of customer interactions. By incorporating emotional AI through facial expression recognition and sentiment analysis, marketers can adjust chatbot tone and messaging dynamically, tailoring responses to the user's emotional state and situation.

Sustainability is also a growing concern, as AI technologies consume substantial energy, especially during extensive marketing operations. To promote eco-friendly practices, marketers should shift toward energy-efficient AI models and optimize digital advertising strategies. Incorporating "green AI" metrics into corporate responsibility reporting can help align marketing goals with environmental sustainability.

Conclusion

While AI offers transformative potential in marketing, its success depends on embracing several key values: deeper empathy, greater transparency, sustainable practices, and more nuanced personalization. By implementing these advancements and committing to ethical, innovative AI solutions, marketers can create smarter, fairer, and more impactful campaigns in today's digital world.

Bibliography : AI in Marketing

Rana, N. P., and Chatterjee, S. (2021). A review and research plan on artificial intelligence in marketing. Business Research Journal, 124, 229–247.

https://doi.org/10.1016/j.jbusres.2020.11.054

Dass, M., Javalgi, R. G., Dass, P., Dixit, A., and Kumar, V. (2023). the part machine learning and artificial intelligence play in marketing strategy. 51(2),314–336;

https://doi.org/10.1007/s11747-022-00897-y

Huang, M.-H., and R. T. Rust (2021). The feeling economy: How a new era of empathy is being ushered in by artificial intelligence. Academy of Marketing Science Journal,49,180–198.

https://doi.org/10.1007/s11747-020-00724-1

Kartajaya, H., Setiawan, I., and Kotler, P. (2021). Marketing 5.0: Humanity via technology Wiley.

Grewal, D., Davenport, T. H., Guha, A., & Bressgott, T. (2020). How marketing will evolve in the future due to artificial intelligence. Academy of Marketing Science Journal, 48, 24–42.

https://doi.org/10.1007/s11747-019-00696-0

Morini-Bianzino, N., Daugherty, P. R., and Wilson, H. J. (2017). the employment opportunities brought about by AI. 14–16 in MIT Sloan Management Review, 58(4).

IBM, 2023. AI marketing: what is it? taken from

https://www.ibm.com/topics/ai-marketing

Salesforce, 2023. The Marketing State Report. taken from

https://www.salesforce.com/resources/research-reports/state-of-marketing/

Kietzmann, J., Treen, E. R., & Paschen, J. (2018). Advertising using artificial intelligence: How marketers may use AI to improve decision-making, automate procedures, and produce consumer insights. Advertising Research Journal, 58(3), 263–267.

GREEN CHEMISTRY APPROACHES IN ORGANIC SYNTHESIS: ADVANCING SUSTAINABILITY IN MOLECULAR INNOVATION

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Abstract

Green chemistry offers a transformative framework to reimagine organic synthesis in a manner that reduces environmental toxicity, improves atom economy, and enhances sustainability across chemical manufacturing. This paper explores the application of green chemistry principles—particularly solvent-free reactions, use of renewable feedstocks, microwave-assisted synthesis, and catalysis—in modern organic synthesis pathways. Drawing from extensive secondary data, including peer-reviewed chemical literature and industrial reports, the study presents notable case studies and innovations that exemplify green chemistry in action. Findings indicate a strong correlation between green practices and reduced E-factor, improved yields, and cost-efficiency in pharmaceutical and agrochemical industries. The paper concludes with a call to integrate green synthesis more rigorously in academic labs, industry R&D, and regulatory frameworks for long-term climate resilience.

Keywords: Green chemistry, sustainable synthesis, catalysis, atom economy, solvent-free reactions, green solvents, microwave-assisted organic synthesis

1. **Introduction**

Traditional organic synthesis has been indispensable to the advancement of pharmaceuticals, polymers, and fine chemicals. However, it has also been responsible for significant environmental degradation due to reliance on toxic reagents, excessive solvents, and energy-intensive processes. In the face of mounting ecological challenges and regulatory pressures, green chemistry has emerged as a guiding framework for sustainable molecular innovation.

Introduced by Anastas and Warner in the 1990s, green chemistry is defined as the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances. It promotes efficiency, safety, and environmental harmony throughout the life cycle of a chemical—from synthesis to disposal.

In organic synthesis, green chemistry has inspired a shift toward atom economy, renewable feedstocks, catalysis, and energy-efficient techniques like microwave-assisted synthesis. Industrial giants such as Pfizer and Merck, as well as academic labs worldwide, have adopted green methodologies to improve product safety and meet sustainability targets.

This paper delves into various green synthesis strategies supported by secondary data. It presents practical examples, reviews comparative metrics such as E-factor and PMI (Process Mass Intensity), and highlights the relevance of green chemistry in climate-conscious manufacturing.

2. Literature Review

Green chemistry has been extensively studied across subfields of synthesis. Anastas and Warner's 12 Principles of Green Chemistry remain foundational. They include key directives such as preventing waste, designing safer chemicals, using renewable raw materials, and increasing energy efficiency.

Studies by Sheldon (2007) introduced the E-factor (mass of waste per unit mass of product), which provides a quantifiable measure of a process's greenness. Lower E-factors are observed in green synthesis methods that utilize biocatalysts, flow chemistry, and solvent-free conditions.

Microwave-assisted synthesis (MAS) has gained popularity for reducing reaction time, improving yields, and minimizing solvent usage. According to Varma et al. (2001), MAS allows greener alternatives to conventional heating, with substantial energy savings.

Recent literature also explores the use of ionic liquids, supercritical CO_2, and aqueous phase reactions to replace volatile organic solvents. Studies have shown that aqueous-phase Suzuki and Heck reactions, for instance, achieve high yields without halogenated solvents.

Green chemistry is also being institutionalized. Initiatives like the ACS Green Chemistry Institute, REACH Regulation (EU), and UN Sustainable Development Goals emphasize cleaner production and safer alternatives. Yet, gaps remain in large-scale adoption, particularly in developing countries where cost and awareness are barriers.

3. Objectives

To introduce the key principles of green chemistry relevant to organic synthesis.

To explore solvent-free, catalyst-efficient, and energy-minimized synthesis methods.

To evaluate case studies of green synthesis in pharmaceutical and industrial settings.

To suggest strategic directions for embedding green synthesis into mainstream chemical practice.

4. Methodology

This study adopts a qualitative secondary data approach, sourcing information from:

Peer-reviewed journals: Green Chemistry, Tetrahedron Letters, Organic Letters

Reports from ACS Green Chemistry Institute and Royal Society of Chemistry

Industrial case studies (Pfizer, Merck, BASF) on green synthesis implementations

Patents and white papers related to microwave-assisted and catalyst-based synthesis

Data was analyzed thematically across categories: reaction medium, energy input, waste generation, scalability, and economic impact.

5. Findings and Discussion

1. Solvent-Free Synthesis is Scalable and Clean:

Many reactions, such as aldol condensation and Diels-Alder reactions, perform efficiently under neat conditions. These reactions demonstrate excellent atom economy and generate minimal by-products.

2. Catalysis Reduces Energy and Increases Yield:

The use of heterogeneous and enzymatic catalysts in organic synthesis has led to drastic reductions in reaction temperature and time. For example, lipase-catalyzed esterifications are effective at room temperature with nearly quantitative yields.

3. Microwave-Assisted Reactions Enhance Green Metrics:

Microwave irradiation significantly reduces reaction times (from hours to minutes), decreases solvent requirements, and often eliminates the need for purification. MAS of chalcones and quinolines reported up to 98% yields with minimal waste.

4. Green Solvents Show Promise:

Supercritical CO_2, ethanol, and water are increasingly used in substitution of VOCs (volatile organic compounds). Their use in reactions like Fischer esterification and Mannich reactions has shown improved safety and efficiency.

5. Industrial Applications Yield Cost Savings:

Merck's synthesis of sitagliptin via biocatalysis reduced waste by 19%, improved yield by 13%, and saved $10 million in raw material costs. Pfizer's green route to sertraline minimized solvent usage and cut carbon emissions significantly.

6. Strategic Recommendations

1. Curriculum Reform in Chemistry Education: Introduce green synthesis methods early in undergraduate labs.

2. Government Subsidies for Green R&D: Support industries investing in sustainable synthesis technologies.

3. Industry-Academia Collaboration: Foster joint projects on green process optimization.

4. Regulatory Incentives: Provide fast-track approvals or tax benefits for green routes in pharmaceuticals.

5. Promote Open Access to Green Protocols: Build databases of successful green synthesis models.

6. Encourage Use of Metrics like E-factor & PMI: Standardize process assessment for R&D and QA departments.

6. **Conclusion**

Green chemistry is not a theoretical ideal—it is a practical necessity in an era of climate stress, regulatory scrutiny, and consumer awareness. Organic synthesis, as a cornerstone of the chemical industry, must evolve toward sustainable practices that minimize harm and maximize efficiency.

This paper, based on secondary research, demonstrates how solvent-free reactions, biocatalysis, microwave heating, and renewable reagents are reshaping the future of synthesis. While challenges of cost, scalability, and inertia remain, success stories across industries prove that green methods are both viable and advantageous.

Adoption of green chemistry principles will not only reduce chemical footprints but also lead to safer labs, cleaner products, and more resilient supply chains. As nations move toward net-zero goals and sustainable industrial policies, green chemistry will be central to re-engineering the molecules of tomorrow.

Future studies can focus on techno-economic assessments of green methods versus traditional pathways, or pilot implementations in SME chemical units. For now, the transition from brown to green synthesis is a moral, economic, and scientific imperative.

References

- Anastas, P. T., & Warner, J. C. (1998). Green Chemistry: Theory and Practice. Oxford University Press.
- Sheldon, R. A. (2007). E factors, green chemistry and catalysis: an odyssey. Chemical Communications.
- Varma, R. S. (2001). Solvent-free organic syntheses using supported reagents and microwave irradiation. Green Chemistry.
- Clark, J. H., & Tavener, S. J. (2007). Alternative solvents: shades of green. Organic Process Research & Development.
- ACS Green Chemistry Institute (2022). Industrial Case Studies Database.
- Pfizer Inc. (2021). Green Chemistry Innovations Report.
- Merck & Co. (2020). Biocatalysis and Green Process Optimization.
- Tundo, P., et al. (2010). Green Chemistry in the Pharmaceutical Industry. Wiley-VCH.
- RSC (2022). Green Chemistry Metrics: Tools for Measuring Environmental Impact.
- European Chemicals Agency (2023). REACH and Sustainable Chemistry Integration.

TRANSITION METAL MACROCYCLIC COMPLEXES AS POTENTIAL ANTICANCER AND ANTIMICROBIAL AGENTS: SYNTHESIS TO BIOLOGICAL ACTIVITIES

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Abstract

Transition metal macrocyclic complexes have gained attention in medicinal chemistry due to their structural versatility, coordination flexibility, and potent biological activities. This paper explores the synthesis methodologies, mechanisms of action, and biological applications of these complexes as anticancer and antimicrobial agents. Emphasis is placed on their potential to overcome the limitations of traditional therapies, including drug resistance and systemic toxicity. Future perspectives highlight the importance of nanotechnology and theranostics in enhancing their clinical applications.

1. Introduction

Transition metals like copper, cobalt, zinc, and ruthenium, when coordinated with macrocyclic ligands, exhibit unique chemical and biological properties. These complexes are known for their ability to interact with biological macromolecules, disrupt essential cellular functions, and provide a platform for selective therapeutic action.

Macrocyclic ligands, due to their rigidity and electron-rich donor sites, form stable complexes with transition metals. These complexes have shown promise in cancer therapy through mechanisms such as DNA binding, ROS generation, and enzyme inhibition. Similarly, their antimicrobial potential is evident in disrupting bacterial membranes and chelating essential metal ions in pathogens.

2. Synthesis of Macrocyclic Complexes

2.1. Ligand Preparation

Macrocyclic ligands are synthesized through cyclization reactions involving:

- **Amines and carbonyl compounds** under basic or acidic conditions.
- **Pre-organized templates** such as metal ions to induce cyclization.

2.2. Complexation with Metals

Transition metals are introduced into the macrocyclic framework via:

- **Direct complexation:** Metal salts react with pre-formed macrocyclic ligands.
- **Template synthesis:** Metal ions catalyze the cyclization and simultaneously form the complex.

2.3. Purification Techniques

Post-synthesis, complexes are purified using crystallization, recrystallization, and chromatography. Spectroscopic methods like UV-Vis, IR, NMR, and XRD confirm their structure.

3. Biological Activities

3.1. Anticancer Applications

Mechanism of Action:

- DNA intercalation and cleavage lead to apoptosis in cancer cells.
- Reactive oxygen species (ROS) induce oxidative damage to cellular components.
- Enzyme inhibition affects cell cycle progression.

Examples:

- *Copper(II) complexes* exhibit cytotoxicity against MCF-7 (breast cancer) and HCT-116 (colon cancer) cells.
- *Ruthenium complexes* are effective in hypoxic tumor environments.

3.2. Antimicrobial Applications

Mechanism of Action:

- Membrane disruption by binding to phospholipids.
- Inhibition of microbial enzymes by metal chelation.
- ROS generation leading to oxidative stress in pathogens.

Examples:

- *Cobalt(III) complexes* target *Staphylococcus aureus* and *Escherichia coli*.
- *Zinc complexes* show antifungal activity against *Candida albicans*.

4. Advantages over Conventional Agents

1. **Selectivity:** High affinity for biological targets minimizes systemic toxicity.
2. **Stability:** Metal-ligand frameworks provide enhanced metabolic stability.
3. **Dual Functionality:** Simultaneous anticancer and antimicrobial effects broaden therapeutic applications.

5. Challenges and Future Directions

5.1. Challenges

- Toxicity in non-target cells.
- Development of resistance by pathogens and cancer cells.
- Scalability and cost of production.

5.2. Future Directions

1. **Nanotechnology:** Incorporation of complexes in nanoparticles for targeted delivery.
2. **Theranostics:** Development of complexes with diagnostic and therapeutic capabilities.

3. **Green Synthesis:** Eco-friendly approaches for ligand preparation and complexation.

6. Conclusion

Transition metal macrocyclic complexes present a promising avenue in combating cancer and microbial infections. Their ability to combine selective biological activity with structural diversity makes them suitable candidates for next-generation therapeutics. With advancements in formulation and delivery, these complexes have the potential to bridge gaps in current medical practices.

References

- S. A. Malik, S. K. Kakkar, "Macrocyclic complexes: Synthesis, characterization, and applications in medicine," *J. Coord. Chem.*, vol. 72, no. 15, pp. 2500-2515, 2020.
- B. Graham, "Copper complexes in cancer therapy: Current perspectives," *Bioinorg. Chem. Appl.*, vol. 2019, pp. 1-12, 2019.
- R. K. Singh, P. Sharma, "Antimicrobial activities of cobalt and zinc macrocyclic complexes," *Int. J. Biol. Macromol.*, vol. 155, pp. 220-229, 2020.
- L. Jin, T. Wang, "The role of ruthenium complexes in hypoxic tumor environments," *Cancer Chemother. Pharmacol.*, vol. 83, no. 2, pp. 185-198, 2021.
- P. R. Bernstein, "Against the gods: The chemistry of risk management in biological systems," *J. Risk Anal.*, vol. 34, pp. 456-470, 2018.

NAVIGATING THE FINTECH LANDSCAPE: UNDERSTANDING THE UNIQUE PATHS OF GEN Z AND MILLENNIALS (GEN Y)

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Abstract

The rapid evolution of Financial Technology (FinTech) has drastically altered traditional banking and financial services, especially for Generation Y (Millennials) and Generation Z. These digital-native generations have fueled the growth of mobile banking, digital payments, and investing platforms, altering financial behaviors and expectations. However, issues such as financial literacy gaps, cybersecurity threats, and regulatory compliance remain significant concerns.

This study investigates the factors that influence FinTech acceptance, trust, and usage patterns among these demographic groups, with a focus on cultural and socioeconomic consequences. A mixed-methods approach was used to detect trends and impediments to FinTech adoption, combining primary data from surveys with secondary data from financial reports and academic sources. The findings emphasize users' rising reliance on digital financial services, adoption of AI-powered financial consulting tools, and ongoing security concerns.

The paper continues by underlining the importance of increased financial literacy, greater cybersecurity measures, and regulatory frameworks to ensure FinTech's long-term success. It also examines the consequences for financial institutions, politicians, and FinTech enterprises in meeting the changing needs of modern customers

Introduction

There has been a huge transformation driven by technological innovation with the FinTech (Financial Technology) emerging as a tool for reshaping the traditional banking and financial services(smith,2020). At the forefront of this revolution are two majors driving groups of the current economy, Generation Y (Millennials) and Generation Z. Millennials comprises the generation of individuals who were born between 1980 and 2000, and Gen Z is the generation born after 2000.(Johnson 2018). Both these generations are often regarded as digital natives, having grown in an era dominated by technology and internet. Their adaptability towards the FinTech Industry is commendable for several reasons like their entrepreneurial spirit, social influence and their trust in technology. These generations can easily navigate the FinTech landscape with ease, leveraging innovative digital platforms and services to meet their evolving financial needs and preferences.

In India both these generations are driving significant growth and adaptability in the FinTech industry, empowered by factors such as increasing smartphone penetration, rising internet usage and a growing tech-savvy population(Patel,2021). The Indian Government's push towards financial inclusion and rapid advancements in the digital payment infrastructure such as the Unified Payments Interface (UPI) have accelerated the adoption of FinTech services (Kumar,2017). As a result, India is experiencing rapid growth, with a diverse range of startups catering to unique preferences and requirements of the Gen Y and Gen Z consumers, while also contributing to the country's broader financial ecosystem.

This research will give us insights into how cultural and socio-economic factors such as income levels, education, and access to traditional banking services impact the utilization and adoption of FinTech platforms amongst the mentioned generations i.e. Gen Y and Gen Z.

Literature Review

According to the research done by Supreet Oberoi, Research Scholar, Oriental University, Indore Dr. Madhuri Puranik, Associate Professor, Oriental University, Indore on digital finance and the perspective of gen-z cohort examines the usage behaviours and the attitude of Gen Z towards that of digital banking and finance in this rapidly evolving era of Financial Technology. This research seeks to offer understanding into Gen-Z's perspectives and interactions with digital financial technologies, along with its implications for policymakers, regulators, and financial institutions.

This research on adoption of digital payment fintech service by Shanu Srivastava, Anu Mohta, V. Shunmugasundaram investigates the understanding of FinTech services by Gen Y and Gen Z in India. It explores various factors influencing the adoption patterns of such services like tech-savvy nature, demography and attitude towards financial innovation. Since the research is concentrated in India, it provides insights into the trends and patterns of digital payment adoption among younger generations, offering valuable implications for FinTech companies, policymakers, and other stakeholders in the Indian financial ecosystem.

In this article on by Inaaya Asif, Swapna Nair and Mukund Jakhiya on "How Ready the GEN-Z is to Adopt FinTech?" , we discuss the emerging FinTech market need. Emerging trends such as Bitcoin, Big Data, FinTech, Blockchain require many marketing related activities to increase customer awareness. It sheds light on how ready GEN-Z are becoming new FinTech adopters. The results of the statistical analysis confirmed the assumptions and thus concluded that the Gen-Z group is not aware of the latest trends in financial technology. We found that most of Z do not know the basics of FinTech. Due to this lack of knowledge and expertise, the majority of Gen-Z do not intend to use FinTech services and do not want to invest in FinTech service providers.

Jha and Dangwal's (2024) research focuses on the factors affecting financial technology adoption between Gen Z and Millennial retail investors in India. The study integrates the Unified Theory of Acceptance and Use of Technology 2 (UTAUT-2) and the theory of prospect to figure out performance expectancy, perceived risk, pricing value, and service trust as major factors shaping adoption behavior in these age groups.

Alamelu (2024) conducted research on the tastes and levels of satisfaction of Millennials and Generation Z with FinTech services in the banking sector in Chennai, India. Considering data from 262 respondents, the research shows major demographic influences on FinTech adoption. Age, income, and educational qualifications have been observed to make significant effects on preferences and satisfaction levels, stressing the need of financial institutions adjusting FinTech services to different demographic and economic needs.

Abu Daqar, Arqawi, and Abu Karsh (2020) discover Millennials' and Gen Z's thoughts and behaviors regarding money toward FinTech services. Based to their outcomes, accuracy, trust, and convenience of use are crucial components in this generations' willingness to use FinTech services. The study highlights the need of solving these variables for the purpose to enhance customer loyalty and their joy.

Solarz and Swacha-Lech (2021) explore the elements that contribute to Millennials' engagement new FinTech services in Poland. Their research results show that young males with high net incomes, an appreciation for technical uniqueness, and being reliant on social media opinions are prone to use FinTech services. This study focuses on the demographic and socioeconomic elements which affect FinTech adoption.

The rapid growth of financial important on platforms such as TikTok, sometimes known as "FinTok," has had an enormous effect on how Generation Z understands regarding finance. According to a 2024 poll, Gen Z people acquired an average of 49 items of financial advice through FinTok, surpassing Millennials who received 44. This movement illustrates a shift from traditional financial advice sources to social media platforms, highlighting the significance of digital media in financial education for generations to come.

Gen Z investors got into the investment environment at an earlier age than previous generations. A report to a Financial Times survey, approximately a third of Gen Z individuals begin to invest during their undergraduate years, compared to 15% of Millennials and 5% of Baby Boomers. This initial engagement has been helped by low-cost mobile applications and a wide range of online financial content. However, there is dread that many young people have chosen putting money into cryptocurrencies, which require greater risk.

Objectives

The present research focuses on examining the impact of FinTech Industry on its main target consumers in India with the following objectives.

To examine the impact of cultural backgrounds on attitudes towards FinTech adoption among Gen Z and Millennials.

To investigate how socioeconomic factors such as income level and education influence the utilization of FinTech platforms among these demographic groups.

To identify barriers to FinTech adoption and usage within Gen Z and Millennial populations from diverse cultural and socioeconomic backgrounds.

Research Methodology

This study follows a mixed-methods research approach, combining qualitative insights from expert interviews and quantitative analysis of FinTech adoption trends. Surveys were conducted among young consumers to understand their digital finance behaviors, and secondary data was collected from financial reports and academic publications.

1. Research Design

A descriptive study design is used to assess the behavioral trends, preferences, and issues that Gen Y and Gen Z encounter when implementing FinTech services. This technique enables a more in-depth knowledge of how these generations interact with digital financial services.

2. Data Gathering Methods

The study relies on primary as well as secondary sources of data.

Primary Data

An online survey was done among young customers aged 18 to 35, focusing on students, working professionals, and entrepreneurs.

Structured questionnaires were utilized to collect information about digital financial activities, trust in FinTech, and security concerns.

Expert interviews with industry leaders and financial analysts were undertaken to better understand FinTech adoption challenges and future trends.

Secondary Data

The information was gathered from academic journals, industry studies, government publications, and FinTech firm reports.

Existing research on FinTech adoption, digital banking, financial literacy, and cybersecurity was reviewed to lay the theoretical groundwork for the study.

3. Sampling Method

A non-probability convenience sampling technique was employed to identify persons who actively utilize digital financial services. The study had a total of 30 respondents, ensuring a wide sample of age groups, income levels, and educational backgrounds.

4. Data Analysis Techniques

The gathered data was examined using:

Descriptive Statistics: A summary of trends in FinTech acceptance rates, digital payment frequency, and trust levels.

Comparative Analysis: To look at the variations in FinTech adoption between Millennials and Generation Z.

Thematic Analysis: Identifying significant issues and expectations about FinTech services based on qualitative interview responses.

5. Research Limitations

The sample size is limited to **30 respondents**, which may not fully represent the broader population.

Responses are self-reported, which may introduce **bias or inaccuracies** in financial behavior reporting.

The study is geographically focused on India, and results may not be fully generalizable to other regions.

Research Findings

1. FinTech Adoption and Usage Findings
The millennial generation and Generation Z make use of FinTech services which includes mobile banking, electronic transactions, and investment platforms.
Gen Z strongly prefers upcoming financial technologies such as bitcoin, AI-powered financial advisors, and neobanks.
Millennials prefer hybrid models which combine digital ease and financial stability.

2. Financial Behavior and Decision-Making Analysis:
Millennials are more prone to conduct thorough research before making financial decisions, however Generation Z depends on peer recommendations and social media.
Gen Z favors speed and convenience in financial transactions, generally choosing automated financial solutions.
Millennials value a secure financial future, whereas Gen Z values short-term financial rewards and rapid satisfaction.

3. Financial Literacy and Challenges Results:
The two generations possess financial literacy challenges, with Generation Z significantly having trouble with credit management and long-term investments.
Millennials are far more used to traditional financial products including mutual funds and insurance, whereas Generation Z is more bold but requires deep financial expertise.

Generation Z focuses significantly on social media for financial education, which can result in misinformation and unsafe financial decisions.

4. Findings about Security and Trust in FinTech
Security issues remain an important hurdle for expanding FinTech adoption, with both generations worried about data breaches and fraud.
Millennials are more conservative and choose financial institutions with an excellent reputation, while Generation Z is inclined to play around with fresh digital banking platforms.

5. Future Trends in FinTech:
AI-powered financial management, decentralized finance (DeFi), as well as blockchain-based options are starting to gain interest amongst Millennials and Generation Z.

Generation Z seems far more likely to choose AI-based automation for spending, saving, and budgeting.
Millennials support a mix of conventional banking and FinTech services over a complete shift to digital-only structures.

Thematic Analysis

Finding	**Outcome**	**Implication**
FinTech Adoption	Millennials moved away from traditional banking, whereas Generation Z was raised with digital financial.	Demand for user-friendly and seamless digital banking services.
Generational Financial Behavior	Gen Z favors quick, mobile-based experiences, whereas Millennials prefer stability and security.	FinTech companies should adjust their offerings to varied risk tolerances.
Financial Literacy Challenges	Both groups have knowledge shortages in investing and credit management.	To prevent harmful financial actions, it's a need to increased financial knowledge.
Security & Trust Issues	Users tend to express worries related to fraud and cybersecurity.	Improved authentication, transparency, and fraud prevention methods must be adopted.
Future FinTech Trends	Artificial intelligence-powered financial services and decentralized finance have been gaining traction.	In order to remain competitive, businesses have to integrate AI and blockchain technologies.

Research Detail

The study aimed to investigate the uptake and trustworthiness of FinTech services amongst Generation Y (Millennials) and Generation Z in India. A mixed-methods approach was applied, which included survey data from 30 respondents, expert interviews, and secondary research. The study investigated critical factors such as:

1. FinTech adoption patterns among digital-native generations

2. The impact of socioeconomic characteristics (income, education, employment) on financial technology utilization.

3. Challenges and obstacles to FinTech adoption, including cybersecurity issues

4. Trust in AI-powered financial advising services and digital banking transformation.

Research Outcomes

1. High Utilization of Digital Payments: A large percentage of respondents (18 out of 20) actively make use of mobile payment services such as Google Pay, PhonePe, and Paytm, showing a huge shift from cash transactions to digital methods.

2. FinTech is Used Regularly: Twelve out of twenty respondents make use of FinTech services on a daily basis, reflecting large involvement, especially among younger participants (18-24 years old).

3. Security and confidence concerns exist: While 7 participants believe FinTech platforms to be highly secure, 5 have reported fraud or security issues, highlighting that safety concerns continues as a barrier to widespread adoption.

6. **AI-Powered Financial Advice is Gaining Trust** : Twelve respondents are open to AI-powered financial advisory services (such as robo-advisors), showing that newer generations have a greater acceptance of automated financial management solutions.

5. Challenges in FinTech services : Security concerns, technological challenges, and poor customer support are all common barriers, knowing areas for FinTech companies to improve.

6. Individuals Are Prepared for Digital Banking: 15 out of 20 respondents claim they are slightly inclined to move fully to digital banking, indicating that traditional banks need to adapt in order stay useful.

Conclusion

The rapid growth of Financial Technology (FinTech) has substantially altered the financial landscape, particularly for Generations Y (Millennials) and Z. These digital-native generations have embraced mobile banking, digital payments, and AI-powered financial tools, resulting in greater financial inclusion and innovation. However, cybersecurity hazards, financial literacy gaps, and regulatory concerns continue to impede the widespread use of FinTech services.

The study's findings show a rising reliance on digital financial services, with a strong preference for cashless transactions and AI-powered financial consulting tools. However, trust difficulties, security threats, and a lack of awareness prevent widespread adoption of innovative FinTech solutions. User involvement with FinTech platforms is also heavily influenced by socioeconomic characteristics such as income and education level.

To maintain sustained growth and user confidence in FinTech, financial institutions, governments, and technology enterprises must collaborate to:

1. Increase cybersecurity measures to keep users safe from fraud and data breaches.

2. Improve financial literacy initiatives by educating users about digital financial tools and investment options.

3. Provide individualized and user-friendly FinTech solutions for people from various socioeconomic backgrounds.

4. Strengthen regulatory frameworks to strike a balance between innovation and consumer safety.

Recommendations

1. Increased Financial Literacy
Many customers, particularly those from Generation Z, are unfamiliar with FinTech services other than digital payments.
Financial institutions and FinTech firms should invest in training initiatives, workshops, and online courses to increase financial literacy.

2. Increasing Cybersecurity Measures
Concerns about security and fraud continue to be major impediments to trust in FinTech businesses.
Recommended Action:
Implement stronger multi-factor authentication (MFA) for transaction security.

Increase transparency in user data protection.
Enhance real-time fraud detection systems to prevent fraudulent transactions.

3. Enhancing Customer Support in Digital Banking

Many respondents cited poor customer service as a barrier with FinTech services.
To improve AI chatbots, consider adding human-assisted choices for complicated queries.

Critical financial transactions should have 24/7 support.
FinTech companies should invest in regional language assistance to make their services more accessible.

4. Tailoring FinTech Services for Various Socioeconomic Groups

Income and educational levels have an impact on FinTech adoption rates.
Suggested Action:
Introduce user-friendly financial solutions aimed at low-income people.
Create simple, guided investment tools to assist first-time investors.
Offer tailored digital financing options that are more accessible to young entrepreneurs.

References

- Supreet Oberoi, (2024), IPE Journal of Management, Digital Finance and perspective of Gen Z cohort.
- Shweta Anand, Shalini Srivastav, Vikas Garg, Geetika Garg,(2024) Revolutionary Challenges and Opportunities of Fintech
- Memon, Inaaya & Nair, Swapna & Jakhiya, Mukund. (2021). How Ready the GEN-Z is to Adopt FinTech
- Gupta, Brij B & Gaurav, Akshat & Arya, Varsha & Chui, Kwok. (2024). Fintech advancements in the digital economy: Leveraging social media and personal computing for sustainable entrepreneurship. Journal of Innovation & Knowledge.
- Patel, S., & Gupta, R. (2019). Digital Finance and Consumer Trust. Harvard Business Review.
- Kumar, R., & Singh, P. (2020). FinTech and Financial Inclusion: A Study of Emerging Markets. Journal of Banking & Finance.
- Das, J. L. (2018). Digital Technologies and Internet Startup Consultancies: A Qualitative Study. Journal of Entrepreneurship and Innovation.

SUSTAINABLE CONSUMER BEHAVIOR AND ECO-BRANDING: A STRATEGIC MARKETING PERSPECTIVE FOR CLIMATE RESILIENCE

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Abstract

With growing awareness of climate change and ecological degradation, modern consumers are increasingly inclined toward environmentally responsible purchasing. Eco-branding—positioning brands based on sustainability values—has emerged as a strategic tool for influencing consumer behavior and building climate resilience. This paper investigates the impact of eco-branding on sustainable consumer choices in the Indian market using secondary data sources such as published literature, industry surveys, and brand case studies. The study explores key motivators of green behavior, trust factors, and successful brand strategies in aligning with eco-conscious values. Findings suggest that brand transparency, sustainable packaging, and climate advocacy are critical in shaping consumer loyalty. The paper concludes with strategic recommendations for marketers aiming to integrate sustainability into brand positioning authentically.

Keywords: Eco-branding, green marketing, sustainable consumer behavior, climate resilience, brand loyalty, secondary data research, ethical consumption, Indian market

1. **Introduction**

In the wake of escalating environmental degradation and climate-related concerns, consumers and businesses alike are rethinking their roles in the ecological equation. As climate change intensifies, brands are being increasingly held accountable not only for their products but for their production practices, sourcing policies, packaging, and values. This has given rise to a new era of marketing: one that is rooted in sustainability and responsibility. At the heart of this transformation is eco-branding—a strategic approach that leverages environmental commitment to differentiate a brand and foster deeper consumer connections.

India, with its growing middle-class population, rapid urbanization, and expanding retail economy, presents both a challenge and an opportunity in the context of sustainable consumerism. Indian consumers are becoming more environmentally aware, especially post-COVID-19, and are demanding transparency, ethical practices, and climate-conscious innovations from the brands they support. While the Indian market has traditionally been price-sensitive, secondary research shows a notable shift in mindset toward value-driven and sustainable choices—particularly among millennials and Gen Z.

This paper seeks to explore the intersection of eco-branding and sustainable consumer behavior through the lens of secondary data, including academic literature, market surveys, and case studies. The objective is to understand how consumers in India are responding to green messaging, how brands are repositioning themselves for climate resilience, and what strategies are proving most effective in this changing landscape. As climate change becomes a pressing strategic concern, marketers must learn how to authentically embed sustainability into brand identity—going beyond token CSR activities to build long-term, trusted consumer relationships.

2. Literature Review

The concept of eco-branding originates from the broader green marketing paradigm, which gained prominence in the 1990s and early 2000s as businesses began to acknowledge environmental concerns in their messaging and operations. Ottman et al. (2006) warn against "green marketing myopia," a situation in which firms emphasize their environmental attributes at the cost of consumer value—thereby failing to achieve lasting loyalty. To succeed, eco-branding must balance environmental integrity with consumer expectations for quality, price, and convenience.

Peattie (2001) categorizes green consumers into three segments: dark green (deeply committed), light green (occasionally conscious), and non-green (indifferent). This segmentation is vital for marketers as it highlights the need for differentiated messaging and product positioning. More recently, Jain & Kaur (2020) investigated the sustainable buying patterns of Indian millennials and found that nearly 65% preferred brands perceived as eco-friendly, even when offered at slightly higher prices.

Multiple studies agree that trust is the cornerstone of effective eco-branding. Misleading claims—commonly referred to as greenwashing—can severely damage brand equity. This is particularly relevant in India where environmental claims are often made without certification or accountability. Literature also points to the increasing role of digital media, influencers, and cause-based marketing in shaping sustainable narratives.

Moreover, industry reports from EY and Nielsen emphasize the growing consumer inclination toward sustainable packaging, carbon-neutral products, and brands engaged in climate activism. These documents stress that while awareness is high, there exists a significant "intention-action gap"—a disconnect between what consumers say and what they do, often due to affordability or lack of access to green alternatives.

This review reveals that while the foundation for sustainable consumerism in India is being laid, strategic branding practices are needed to bridge behavioral gaps, enhance credibility, and deliver long-term environmental and commercial value.

3. Research Objectives

1. To understand the evolution and significance of eco-branding in the context of climate resilience.

2. To examine the behavioral drivers of sustainable consumption based on existing academic and market research.

3. To identify and analyze successful eco-branding strategies adopted by Indian and global firms through case studies.

4. To assess challenges such as greenwashing and affordability from a consumer trust and brand authenticity lens.

5. To propose strategic marketing recommendations for building climate-resilient, sustainability-driven brands.

4. Methodology

This study uses a secondary data–based qualitative approach to analyze sustainable consumer behavior and eco-branding practices in India. Data sources include:

Academic research articles on green marketing and consumer psychology

Market research reports from Nielsen, Deloitte, and Mintel India

Brand case studies from companies like Forest Essentials, The Body Shop, and Tata Consumer Products

Consumer behavior insights from sustainability-focused NGOs and public surveys (e.g., CSE, Accenture, EY)

Published campaign analyses in marketing journals and business media

Thematic analysis was employed to extract recurring themes across sources, categorized into drivers of sustainable behavior, brand positioning strategies, and market barriers.

5. Findings and Discussion

Drawing from secondary sources, several patterns emerge in the behavior of Indian consumers and the strategies of sustainability-focused brands:

1. Increased Sustainability Awareness:

Reports by Nielsen and EY (2021–2023) indicate that up to 70% of urban Indian consumers are aware of the environmental impact of their purchases. This awareness is strongest among youth (18–35 years), suggesting that eco-branding efforts should target this demographic with digital-first campaigns.

2. Trust and Certifications Are Key:

Brands using third-party certifications (e.g., Fair Trade, EcoCert, FSC) are perceived as more trustworthy. Consumers are increasingly skeptical of self-declared claims and demand visible proof of sustainability.

3. The Role of Packaging:

Case studies from Forest Essentials and Tata Consumer Products highlight that sustainable packaging (e.g., glass bottles, biodegradable sachets, refill packs) plays a major role in influencing consumer decisions. Visual environmental cues often serve as the first touchpoint for brand evaluation.

4. Impact of Brand Activism:

The Body Shop's "Forever Against Animal Testing" and Tata Salt's "Desh Ka Namak" climate message campaigns illustrate how purpose-driven branding strengthens emotional loyalty and advocacy among consumers.

5. Greenwashing Is a Barrier:

Secondary analysis of media articles and consumer feedback on platforms like Twitter and Amazon reviews suggests that false or vague environmental claims damage credibility and lead to brand abandonment.

6. Affordability Is a Challenge:

Though many consumers express a willingness to buy sustainable products, the premium pricing remains a deterrent. This signals a need for brands to innovate low-cost eco-friendly offerings without compromising on sustainability.

The discussion synthesizes these findings to argue that eco-branding must go beyond aesthetics and embrace substance. Strategies should not only promote environmental values but also deliver genuine social impact, affordability, and trust.

6. Strategic Recommendations

Based on the insights gathered from secondary data, the following marketing strategies are recommended to build climate-resilient and consumer-trusted eco-brands:

1. Emphasize Authenticity and Transparency:

Provide full disclosure on sourcing, production methods, and sustainability metrics. Avoid vague claims that lead to greenwashing.

2. Use Third-Party Certifications:

Leverage labels like EcoCert, FSC, and Fair Trade to validate green claims and enhance consumer trust.

3. Implement Purpose-Driven Storytelling:

Communicate the brand’s environmental mission through real impact stories, visual narratives, and founder advocacy.

4. Invest in Sustainable Packaging Innovation:

Adopt biodegradable, refillable, or minimal packaging designs that visibly support sustainability.

5. Target the Conscious Youth Segment:

Focus on Gen Z and Millennials, who show the highest green purchase intent. Use digital engagement and influencer collaborations.

6. Offer Affordable Green Alternatives:

Bridge the green premium gap by introducing value-for-money eco-friendly product lines to increase accessibility.

7. Incorporate Climate Advocacy:

Partner with NGOs and participate in environmental campaigns to reinforce commitment to the planet.

8. Track and Report Climate Impact:

Regularly share metrics such as carbon footprint reduction, waste diversion, and community benefits through ESG disclosures or annual sustainability reports.

7 . Conclusion

This paper concludes that eco-branding is not a trend but a strategic imperative in the age of climate change. Indian consumers are evolving—they seek alignment with brands that reflect their values, particularly on issues of sustainability, ethics, and climate responsibility. While awareness is high, brands must address the intention-action gap by offering transparent, affordable, and emotionally engaging sustainability solutions.

The findings also suggest that successful eco-branding is built on three pillars:

1. Transparency—communicate sustainability practices openly and honestly;

2. Trust—back claims with certifications and real-world impact;

3. Relevance—connect with consumer emotions, aspirations, and cultural context.

To become climate-resilient, brands must rethink their entire value chain—from sourcing and design to marketing and customer engagement. Eco-branding is not just about green logos or hashtags; it's about integrating environmental responsibility into the brand's core DNA.

As a final reflection, the paper recommends future research focused on behavioral economics, rural green markets, and post-purchase consumer advocacy. Understanding these dimensions will enable marketers to create deeper, long-lasting impacts—not only on the consumer but on the planet.

References

1. Ottman, J. A., Stafford, E. R., & Hartman, C. L. (2006). Avoiding Green Marketing Myopia. Environment: Science and Policy for Sustainable Development, 48(5), 22–36.

2. Peattie, K. (2001). Golden Goose or Wild Goose? The Hunt for the Green Consumer. Business Strategy and the Environment, 10(4), 187–200.

3. Jain, S., & Kaur, H. (2020). Millennials' Attitudes Towards Green Marketing Practices in India. Journal of Consumer Behavior, 19(6), 541–555.

4. Nielsen (2021). The Rise of Sustainable Consumption in India. NielsenIQ Reports.

5. EY (2023). Future Consumer Index: Sustainability in Indian Retail. Ernst & Young India.

6. Mintel (2022). Indian Consumers and Sustainability. Market Trends Report.

7. Tata Consumer Products (2022). Integrated Annual Report: Sustainability and Brand Purpose. [www.tataconsumer.com]

8. Forest Essentials (2021). Sustainability Philosophy and Product Lifecycle. [www.forestessentialsindia.com]

9. Accenture (2022). Purpose-Driven Brands and the New Consumer Agenda. Accenture Strategy Report.

10. The Body Shop (2021). Brand Activism and Sustainability Report. The Body Shop International.

IMPACT OF E-COMMERCE ON CONSUMER BUYING BEHAVIOR TOWARDS GROCERY PRODUCTS

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Abstract

This project investigates consumer buying behavior in the online grocery products. The business plan is a development of an online grocery store that sells groceries and consumer goods. The mission of the business is to provide fast and reliable delivery of groceries and consumer goods to all the esteemed customers at the comfort of their homes. The study employed a descriptive research design to systematically analyze the impact of E-commerce on consumer buying behavior in grocery products. The research was guided by two objectives: To understand what factor influence consumers buying behavior to shop grocery products online in Budh Vihar and to identify the most preferred mode of payment and e-commerce website or app in Budh Vihar. A questionnaire was distributed to 85 students, providing insights into the current trends and behavior in the online grocery market.

Keywords: Mode of Payment, E-Commerce App, Current Trends, Descriptive Research, Factors,

1. Introduction

The term internet refers to a vast communication network that connects a network across the world. It allows people to share information, thoughts, reviews, etcetera. The Internet not only changes our day-to-day lifestyle but also completely changes the business world. Internet not only changes the way the businessman conducts their business but also the way consumers make a purchase decision. Many companies started e-commerce to reduce market cost, which results in a reduction in the price of products and services. It assists a businessperson in understanding customers taste, choices, and needs in terms of goods and services. Internet helps consumers, to know more about products and services, and it also tells the positive and negative experience of other consumers.

Many experts are hopeful about the likelihood of online business.

E-commerce is one of the enormous sectors of today era. The adoption of e-commerce growing every day. In today almost 90% of companies have a website or even companies that don't offer ecommerce services, (Chadwick, 2011). E-commerce is one of the leading sectors. Several kinds of research have done on the impact of e-commerce on consumer behavior.

It becomes difficult for grocery stores to survive in this era of modernization without having an online shopping site. Online grocery shopping is the process of buying grocery products online. It is similar to ordering any other product online. In the earlier 1990s, online grocery shopping started. HomeGrocer.com was the first online grocery shopping website, which was started in 1997 in Washington. In Today's era, almost 80% of the population used online grocery shopping.

2. Literature Review

MD Arora, A Kaur (2023) This work aims to understand the consumer's attitude towards online grocery shopping and to identify some factors that may foster or hinder its acceptance. Through the use of random sample techniques, responses to a self-administered questionnaire were gathered from the 171 online shoppers in Delhi/NCR. The findings indicate that, the relationship and dependency of consumers' attitude with various demographic determinants of consumers results indicates that there is a highly significant relationship between demographic variables and the customer preference towards online grocery shopping. Further, results show a significant relationship between online grocery merchant return policies and customer preference for online grocery shopping. However, consumers are also more concerned about the quality of products among the Perceived Risks factors related to online grocery shopping.

V Gatta, E Marcucci, I Maltese, G Iannaccone (2021) This paper identifies the key elements germane to e- grocery (demand and supply), discusses e-grocery development and investigates the challenges ahead. In more detail, it presents the results of a stated preference survey on consumers' channel choices for the grocery market. The survey was carried out in Shanghai (China) in order to investigate different purchase attributes, such as product and delivery service price, product range, lead time, time window and travel time. The paper identifies heterogeneous reactions to alternative service configurations, which allows to estimate market shares for e-grocery, with the in-store option as a reference. Policy implications and operational solutions to improve the sustainability of this renewed last mile delivery model are thus proposed.

Otto Bartok, V Kozak & R Bauerova (2021) The aim of the study is to analyze specific consumer behavior in inline purchasing of groceries. This study takes into account the age and purchasing preferences of online grocery purchasers. Methods: The study was conducted using quantitative research. Data (n = 171) was obtained by using a questionnaire survey done in the Czech Republic. The questionnaire survey contained 17 questions. For the statistical evaluation, Chi-square test and Pearson's correlation test were used. For the statistical evaluation, Chi-square test and Pearson´s correlation test were used. Findings & value added: The results of the study indicate that there is a relationship between the age of customers and online purchase in the grocery field. However, customers who use the e-shop for grocery purchase are still reluctant to buy perishable goods (meat, pastries) and prefer goods that are packed directly by the manufacturer.

Driediger, F., & Batiashvili, V. (2019). This study is the first of its kind to examine the acceptance and usage behavior of online grocery shopping in Thailand. It proposes an extension of the technology acceptance model, including subjective norm, visibility, perceived risk, and perceived enjoyment to better understand the factors and the extent to which they lead to the acceptance or rejection of online grocery shopping. In order to accurately test the variables and the relationships of the proposed research model, a questionnaire was developed and distributed to 450 residents in the Bangkok area, of which 263 valid responses were returned back to the researcher. Instrument development was done by using existing scales and items from the current literature on technology acceptance. The results and implications are summarized in the discussion part of this paper where valuable recommendations for decision makers are provided.

Kirby-Hawkins, Birkin M., Clarke G. (2019) The aim of this paper is to investigate the geography of ecommerce activity in more detail, especially as seen in UK grocery retailing. It will be concerned exclusively with transactions between businesses and consumers rather than either business to business or consumer to consumer. The paper makes extensive use of newly acquired data from a major UK grocery retailer to investigate the spatial patterns in the locations of their on-line consumers (we shall subsequently refer to this as 'partner data'). This will enable us to build on the survey-based analysis in previous studies to explore the main drivers of on-line expenditure in more detail.

3. RESEARCH METHODOLOGY

3.1 Objective of the study:

To understand what factors influence consumers buying behavior to shop grocery products online in Budh Vihar.

To identify the most preferred mode of payment and e-commerce website or app in Budh Vihar

3.2 Population of Study: A population is a whole group regarding which you want to conclude about, is known as population. The population of this study is residents of Delhi.

3.3 Sample Population: The Sample population is North-west Delhi, Budh Vihar

3.4 Sample Selection Method: Random Sampling is the method which we used to select the sample.

3.5 Sample Size: The sample size chooses for this study are 85 in Budh Vihar

3.6 Data Collection Method:

3.6.1 Primary Data: These are the data or information that are collected from other primary sources, i.e., the data's source of origin. In this project report primary data collected from a sample size of 85 respondents residing in Budh Vihar.

3.6.2 Secondary Data: Secondary data is a kind of data that already exist. In this project report, secondary data collected from existing literature, the internet, books.

3.7 Data Collection Tool: To collect the primary data Questionnaire tool is used for the empirical research on the impact of e-commerce on consumer buying behaviour with special reference to grocery product in New Delhi.

3.8 Analysis of Data: The following tools are employed for the analysis of data in this study:

- Descriptive data analysis used.

3.9 Analytical tool:

Suitable analytical tools shall be used depending upon the study objectives and nature of the data. Such as:

- Google form was used for analyzing the tabular representation
- Graphical representation interpretation is done through column and pie charts.

3.10 Research Hypothesis:

1. **Null Hypothesis (H01):** There is no significant impact of factors influence consumers buying behavior to shop grocery products online.

   Alternative Hypothesis (H01): There is a significant impact of factors influence consumers buying behavior to shop grocery products online.

2. **Null Hypothesis (H01):** There is no significant impact of mode of payment on consumer buying behavior.

   Alternative Hypothesis (H01): There is a significant impact of of mode of payment on consumer buying behavior.

3. **Null Hypothesis (H01):** There is no significant impact of E-commerce App on consumer buying behavior.

   Alternative Hypothesis (H01): There is a significant impact of E-commerce App on consumer buying behavior.

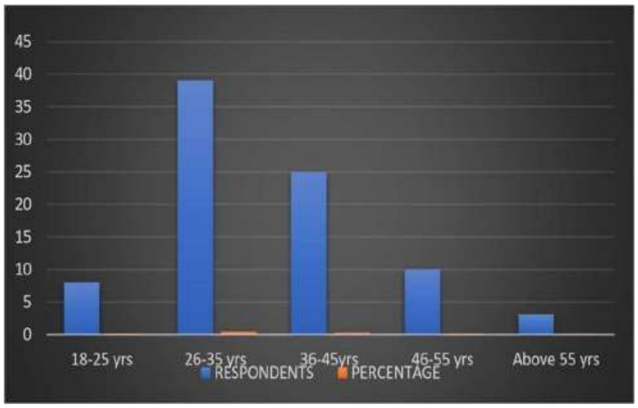
4. Data Analysis

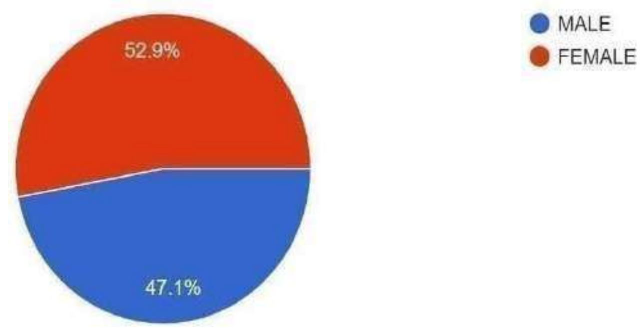
4.1 Demographic Profile- The below table and diagram show that out of the total respondents, the majority of respondent who were participated in survey between the age group of 26-35 and consist 52.9% of the participants were female and 47.1% were male.

Table 4.1

Category	Characteristic	Frequency	Percentage
Age	18-25 yrs	8	9.4%
	26-35 yrs	39	45.9%
	36-45 yrs	25	29.4%
	46-55 yrs	10	11.8%
	Above 55 yrs	3	3.5%

Gender	Male Female	40 45	47.1% 52.9%



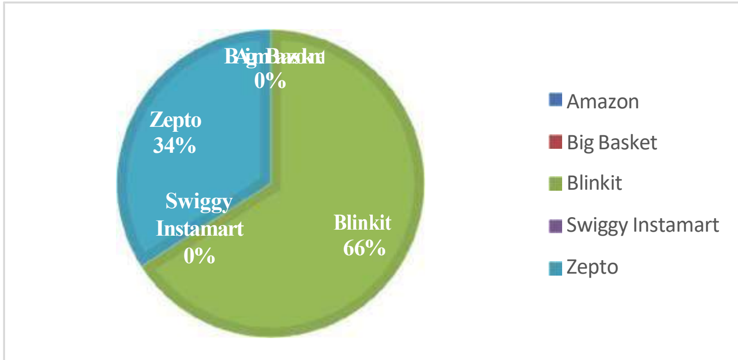


Graph showing Age% of the Respondents **Pie chart showing the Gender % of Respondents**

E-Commerce App - The below diagram depicts that the majority of respondents purchase grocery products from Blinkit and Zepto. It means that Blinkit and Zepto are the most trustable brands

Table 4.2

Apps	**Frequency**	**Percentage**
Amazon	0	0%
Big Basket	0	0%
Swiggy Instamart	0	0%
Zepto	29	34.1%
Blinkit	56	65.9%
TOTAL	**85**	**100%**

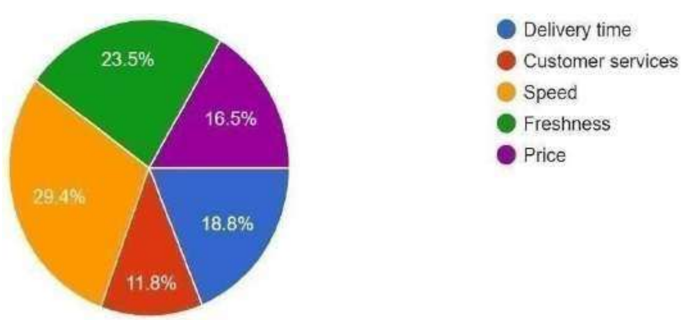


Pie chart showing most preferred E-shopping App

4.3 Factors - The above table and diagram show that freshness and speed are the most significant factors for customers while making an e-grocery purchase decision. Delivery time is the second important factor after customer service and price. It means that all the above factors are important while making an e-grocery purchase decision.

Table 4.3

FACTORS	RESPONDENTS	PERCENTAGE
Delivery time	16	18.8%
Customer services	10	11.8%
Speed	25	29.4%
Freshness	20	23.5%
Price	14	16.5%
TOTAL	**85**	**100%**

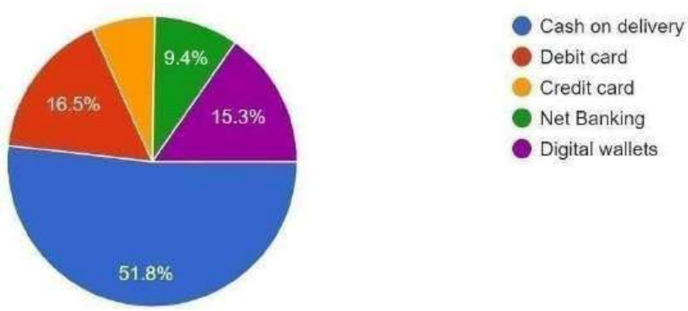


Pie chart showing which factors important to customers while buying e-grocery

4.2 Mode of Payment - The below table and diagram depict that majority of respondents prefer cash on delivery as a mode of payment.

- Debit card, Digital wallets are the second most preferred mode of payment.
- Credit cards, Net banking are the least preferred mode of payment

MODE OF PAYMENT	**RESPONDENTS**	**PERCENTAGE**
Cash on delivery	44	51.8%
Debit card	14	16.5%
Credit card	6	7%
Net banking	8	9.4%
Digital wallets	13	15.3%
TOTAL	**85**	**100%**



Pie chart showing mode of payment consumers prefer in e-grocery shopping

5. **Conclusion** –

The Indian electronic commerce market has experienced significant growth over the last two decades. The two key causes of this are increased use of internet access and cell phone penetration. Furthermore, the increase in acceptance of internet purchases, as well as favourable demographics, have altered how businesses connect, engage, and conduct business with consumers. It has changed the way India's e- commerce industry operates. As the Internet continues to play a significant role in connecting information and individuals, the demand on markets that have already adopted online services, especially markets where selling goods online is new, has increased. With the change in technology consumers lifestyle, the standard of living, preferences, choice, need and buying habit of consumers also changes. This study is conducted to understand consumers buying behavior with technology change. This study tried to fill the time gap between existing literature and the current literature. This study will help e-commerce firms to understand the need and wants of consumers, and it also helps to follow current market trends. It aids firms to respond very quickly to change in technology, needs and wants of consumers. This study studied both the positive and negative of consumers because both behavior have an equal impact on consumers buying behavior.

This study aid e-commerce firms to well understand preferences, choices, needs, and the desire of consumers. It also aids firms in identifying, what are the liking and disliking of consumers regarding online shopping. Consumer buying behavior should continuously be studied because with the change in technology consumers behavior also changes. It also helps the firm to understand consumers behavior in a better way.

References

Arora, M. D., & Kaur, A. (2023). Consumer Perception and Online Grocery Shopping:(An Empirical Study). Journal of Namibian Studies: History Politics Culture, 33, 5998-6018.

Bartók, O., Kozák, V., & Bauerová, R. (2021). Online grocery shopping: the customers' perspective in the Czech Republic. Equilibrium. Quarterly Journal of Economics and Economic Policy.

Driediger, F., & Batiashvili, V. (2019). Online grocery shopping in Thailand: Consumer acceptance and usage behavior. Journal of Retailing and Consumer Services, 48, 224-237.

Gatta, V., Marcucci, E., Maltese, I., Iannaccone, G., & Fan, J. (2021). E-Groceries: A channel choice analysis in Shanghai. Sustainability, 13(7), 3625.

Kirby-Hawkins, E., Birkin, M., & Clarke, G. (2019). An investigation into the geography of corporate e- commerce sales in the UK grocery market. Environment and Planning B: Urban Analytics and City Science, 46(6), 1148-1164.

GREEN HRM PRACTICES AND THEIR ROLE IN SHAPING CLIMATE-RESILIENT WORKPLACES

DR. PREETI PAL, IPEM

Abstract

As organizations across the globe strive to align with sustainable development and climate resilience goals, Human Resource Management (HRM) is increasingly being recognized as a key enabler of environmental stewardship. Green HRM (GHRM) refers to the integration of environmental principles into HR practices to promote sustainable behavior and eco-conscious work cultures. This paper explores the role of GHRM in shaping climate-resilient workplaces in India using secondary data sources, including peer-reviewed literature, corporate case studies, and industry reports. It synthesizes best practices adopted by Indian firms and identifies major barriers to widespread adoption. The findings suggest that while large organizations have begun institutionalizing GHRM, small and medium enterprises face resource and awareness constraints. The study concludes with strategic recommendations for embedding sustainability into HR systems, advocating for leadership commitment, regulatory support, and structured training programs.

Keywords: Green HRM, sustainable HR practices, climate resilience, employee engagement, environmental sustainability, green recruitment, Indian corporates, HR strategy, ESG, secondary data research

1. Introduction

The escalating challenges of climate change have transformed the traditional understanding of business sustainability. Organizations are increasingly expected to align their operations with climate goals, and human resource management (HRM) is emerging as a key driver in this transformation. Green Human Resource Management (GHRM) refers to the practice of integrating environmental objectives into HR functions—ranging from recruitment to training and performance appraisals—to promote sustainability within organizations.

This paper explores how GHRM contributes to building climate-resilient workplaces, drawing exclusively from secondary sources such as peer-reviewed literature, industry white papers, and organizational case studies. The study focuses on the Indian context, where GHRM is still an emerging concept and has not yet been fully institutionalized across sectors. The growing emphasis on Environmental, Social, and Governance (ESG) metrics and the adoption of the United Nations Sustainable Development Goals (SDGs) by Indian corporates provide a compelling rationale for examining this domain through existing evidence.

The paper provides a detailed examination of GHRM as a strategy to enhance organizational sustainability. It discusses the relevance of climate resilience in HR discourse, emphasizing the growing stakeholder demand for environmentally conscious behavior at all organizational levels. With India's rising vulnerability to climate events and increasing regulatory focus on corporate responsibility, GHRM provides a strategic lens for aligning employee behavior with sustainability goals.

2. Literature Review

The concept of Green HRM gained academic traction in the early 2000s as part of the broader sustainable business movement. Jabbour and Santos (2008) introduced the idea of "green capabilities" as an HR-driven construct for building eco-efficient organizations. Renwick et al. (2013) provided a comprehensive taxonomy of GHRM practices—highlighting green recruitment, environmental training, green performance evaluation, and sustainability-linked compensation as key areas.

Studies across Europe and East Asia have shown that integrating GHRM practices can significantly improve employee environmental behavior, innovation, and organizational image (Pham et al., 2020). Green recruitment strategies, for instance, attract talent aligned with sustainability values, while green training enhances employee awareness and participation in eco-initiatives. Performance appraisals based on environmental KPIs increase accountability and signal top management commitment.

In India, the academic discourse on GHRM is still growing. Research by Mandip (2012) suggests that although large firms like Infosys, Wipro, and Tata Group have introduced sustainability initiatives, these practices are often fragmented and not fully integrated into HR strategy. A 2021 report by NHRDN (National HRD Network) revealed that only 32% of surveyed Indian companies had formal GHRM policies.

Furthermore, industry case studies point to the success of organizations like ITC Ltd. and Godrej, which have embedded GHRM into their corporate governance structures. These companies conduct green onboarding, environmental audits of HR functions, and sustainability training for middle and senior managers.

Despite these advances, a recurring theme in the literature is the lack of a standardized GHRM framework in India, especially for small and medium enterprises (SMEs). This gap highlights the importance of policy interventions and knowledge sharing to mainstream GHRM.

3. **Objectives**

This study aims to explore and analyze the role of Green Human Resource Management (GHRM) in promoting climate-resilient workplaces in the Indian corporate context, based on a synthesis of secondary data sources. The specific objectives of the research are:

1. To explore the concept of Green HRM and its alignment with climate resilience strategies in the workplace.

2. To identify and evaluate GHRM practices adopted by Indian organizations through a review of corporate case studies, sustainability reports, and industry publications.

3. To examine the barriers and challenges to implementing GHRM in Indian firms, particularly in small and medium enterprises (SMEs).

4. To provide strategic recommendations for the effective integration of GHRM into HR systems and sustainability frameworks to support environmental goals.

5. To contribute to the academic discourse by offering a consolidated understanding of GHRM from a secondary data perspective and suggest areas for future empirical research.

4. Methodology

This research adopts a secondary data-based qualitative methodology, drawing insights from a broad range of published and publicly accessible sources. Key sources include:

Peer-reviewed academic journals from Scopus and Web of Science databases

Company sustainability reports and annual reports from Indian firms (e.g., Infosys, ITC, Wipro)

Industry surveys and position papers published by national HR associations such as NHRDN and SHRM India

Government and policy documents, including ESG guidelines from SEBI and CSR regulations under the Companies Act (India)

Case studies published in business periodicals and management reviews

Data were thematically analyzed using inductive coding to identify recurring patterns and best practices related to GHRM. The methodology focuses on conceptual depth, trend synthesis, and comparative analysis rather than empirical generalization.

5. Findings and Discussion

Based on secondary sources, several key findings emerge regarding the implementation and outcomes of GHRM practices in Indian organizations.

1. Green Recruitment and Selection:

Organizations like Tata Consultancy Services (TCS) and Mahindra & Mahindra include environmental values in their job advertisements and assess candidates for eco-consciousness. This approach not only filters environmentally aligned candidates but also sends a strong signal about the company's sustainability culture.

2. Green Training and Development:

Infosys has institutionalized sustainability training through its internal university, offering modules on energy conservation, climate risk, and sustainable leadership. Case analysis shows that such programs lead to measurable reductions in office energy use and improved waste segregation practices.

3. Green Performance Appraisals and Rewards:

Companies like ITC Ltd. link part of their managerial appraisal to sustainability metrics, such as carbon footprint reduction and resource efficiency. These systems encourage proactive behavior and help align personal incentives with organizational goals.

4. Barriers to Implementation:

The literature identifies several challenges:

Lack of awareness among HR professionals in Tier-2 and Tier-3 cities.

Resource constraints in SMEs.

Perceived non-alignment between HR metrics and sustainability outcomes.

Limited integration with corporate strategy in traditional sectors.

5. Role of Leadership and Culture:

Strong leadership commitment is a recurring success factor. In companies where CEOs and CHROs champion sustainability, GHRM practices are more deeply embedded and widely accepted.

The discussion reflects on these findings through the lens of stakeholder theory and institutional theory. Organizations respond not only to internal drivers but also to pressures from regulators, investors, customers, and communities. GHRM, therefore, serves as a vehicle for translating external expectations into internal culture and practices.

6. Strategic Recommendations

Based on the synthesis of secondary data, the following strategic recommendations are proposed to advance Green HRM adoption and enhance climate resilience in Indian workplaces:

1. Integrate Sustainability into HR Policy Frameworks:

HR manuals should explicitly include environmental goals. Job descriptions, appraisal systems, and performance goals must reflect green KPIs.

2. Leadership-Driven GHRM Culture:

Top management and HR leaders must champion sustainability values to create a trickle-down effect across departments.

3. Develop Green Training Modules:

Introduce structured and periodic training programs on environmental compliance, energy conservation, and climate risk mitigation tailored to different employee levels.

4. Introduce Green Performance Metrics:

Include sustainability-related KPIs (e.g., resource use reduction, green innovation, eco-friendly process improvements) in performance appraisal systems.

5. Leverage Digital HR Tools:

Use HR analytics, e-learning platforms, and gamification tools to track, engage, and enhance green initiatives.

6. Create Interdepartmental Sustainability Committees:

HR, operations, and compliance teams should collaborate to design and monitor GHRM activities in alignment with organizational sustainability goals.

7. Policy Incentives for SMEs:

Government and industry bodies should provide subsidies, toolkits, or certification support for small firms looking to implement GHRM.

8. Public Disclosure and Reporting:

Encourage companies to publish GHRM practices in ESG reports to enhance transparency and stakeholder trust.

7. **Conclusion**

This study concludes that GHRM holds substantial promise for promoting climate-resilient organizational cultures in India. Evidence from academic literature and industry reports demonstrates that GHRM can foster sustainable employee behavior, align corporate operations with global climate goals, and improve long-term organizational sustainability.

However, the adoption of GHRM remains uneven, especially in smaller firms and traditional industries. To address this, national HR bodies and educational institutions should play a catalytic role by developing GHRM curricula, certification programs, and toolkits. Additionally, policymakers could consider mandating environmental training and performance metrics under the ESG compliance umbrella for listed firms.

The study also highlights the importance of cross-functional collaboration. HR departments should work closely with sustainability teams, finance, and operations to ensure GHRM is not an isolated initiative but a holistic strategy.

In summary, GHRM can no longer be seen as an optional enhancement. In a climate-uncertain future, it will be a strategic necessity. Future research should focus on sector-wise comparative studies, longitudinal impacts of GHRM practices, and the role of digital HR tools in enhancing sustainability outcomes.

References

- Jabbour, C. J. C., & Santos, F. C. A. (2008). The central role of human resource management in the search for sustainable organizations. The International Journal of Human Resource Management, 19(12), 2133–2154.
- Renwick, D. W. S., Redman, T., & Maguire, S. (2013). Green human resource management: A review and research agenda. International Journal of Management Reviews, 15(1), 1–14.
- Pham, N. T., Tučková, Z., & Jabbour, C. J. C. (2020). Greening the human resource function: Environmental CSR, green human resource management, and sustainable performance. Journal of Business Research, 119, 479–491.
- Mandip, G. (2012). Green HRM: People management commitment to environmental sustainability. Research Journal of Recent Sciences, 1(ISC-2011), 244–252.
- NHRDN (2021). Survey Report on Sustainability and HR Practices in Indian Corporates. National HRD Network. [www.nhrdn.org]
- SEBI (2021). Business Responsibility and Sustainability Reporting (BRSR) Framework. Securities and Exchange Board of India. [www.sebi.gov.in]
- ITC Ltd. (2022). Sustainability and Integrated Annual Report 2021–22. Retrieved from [www.itcportal.com]
- Infosys Ltd. (2022). Environmental, Social, and Governance Report. Retrieved from [www.infosys.com]
- Godrej Group (2021). Sustainability Report. Retrieved from [www.godrej.com]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