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Shaping Consumer Sustainability

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A Case Study on Campus Placements in a
University Affiliated B-School



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EDITORIAL : JULY - DECEMBER, 2025

It gives us immense pleasure to present the July–December 2025 issue of Sugyaan. This volume brings together diverse research contributions reflecting contemporary developments in sustainability, corporate governance, economic transformation, banking consolidation, digital literacy, artificial intelligence, global strategy, and management education. The issue underscores methodological rigor, contextual relevance, and interdisciplinary scholarship.

This study explores how AI, IoT, and renewable technologies influence sustainable consumer behavior, particularly electric vehicle adoption. Megha C K and Dr. U. Devisri Prasad stated that, Integrating behavioral theories with sustainability perspectives, the research identifies demographic, psychological, and policy factors shaping EV acceptance, offering strategic implications for marketers and policymakers promoting responsible technological transitions.

Dr Nitasha analyzed web-based voluntary non-financial corporate reporting practices among Indian companies. Using structured disclosure categories such as governance, CSR, and investor information, it evaluates transparency levels and digital reporting trends, highlighting the growing importance of online platforms in strengthening stakeholder communication and corporate accountability.

The research paper of Dr. N. Swapna examines sectoral contributions to India's GDP from 1991 to 2021 through descriptive statistics and cointegration analysis. It reveals structural shifts toward the service sector while assessing agriculture and industry linkages, contributing valuable insights to discussions on balanced growth and long-term economic development.

This empirical study of G. Anil Kumar and Prof. G. Shashidar Rao evaluate the pre- and post-merger performance of SBI and its associate banks. Combining financial ratio analysis with customer and employee perceptions, the findings indicate short-term integration challenges but significant long-term improvements in profitability, asset quality, and operational efficiency.

M. R. Ramesh, Focusing on college students in Chengalpattu, this study investigates the relationship between academic performance, digital literacy, and socio-economic factors. Regression results highlight digital literacy and study habits as strong predictors, providing evidence-based recommendations for enhancing student success in digitally evolving academic environments.

The paper of S. Chinnappala Naidu and Dr. B. R. Doraswamy Naick explores the implementation of AI-enhanced information literacy programs in academic libraries. It discusses benefits such as personalized learning and real-time assistance, while critically addressing challenges including ethical concerns, infrastructure costs, and staff training requirements for effective integration

Saritha B, In her article mentioned that, adopting institutional and resource-based perspectives, this article analyzes the global expansion strategies of Eastern multinational corporations. It demonstrates how emerging-market firms leverage adaptive learning, cost innovation, and strategic flexibility to overcome institutional barriers and build sustainable competitive advantages internationally

In this case study, Dr. Rajeswari Mahankali analyzes campus placements in a university-affiliated B-School, focusing on the role of institutional reputation, alumni engagement, faculty guidance, and student competencies. The study provides practical perspectives on determinants of high-value placements, underscoring the importance of skill enhancement, systematic preparation, and coordinated stakeholder involvement.

We extend our sincere appreciation to all contributors, reviewers, and readers for their continued support in strengthening Sugyaan as a platform for meaningful academic engagement.

Dr. N R K S Chakravarthy

Chief Editor – Sugyaan

FUTURE-DRIVEN CHOICES: ADVANCED TECHNOLOGIES SHAPING CONSUMER SUSTAINABILITY

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ABSTRACT

With a focus on electric vehicles (EVs), this study examines how emerging technologies like artificial intelligence (AI), the Internet of Things (IoT), and renewable energy are influencing consumer behavior towards sustainability. It looks at factors that influence EV adoption, such as government policies, consumer perceptions of sustainability, and technological advancements. It also looks into how these technologies improve energy efficiency. Using a mixed-methods approach, the study aims to uncover the complex relationship between technology and environmental responsibility. Its findings provide useful information for researchers, businesses, and governments looking to promote sustainable futures through technology and informed consumer choices.

Keywords:- Sustainability, Consumer Behavior, Cutting-edge Technology, Electric Vehicles (EVs), Circular Economy

1 Introduction:

The relationship between consumer sustainability and cutting-edge technology has drawn more scholarly and policy attention at an era of fast technological advancement and increased environmental concerns. In addition to changing production and consumption patterns, emerging technologies like artificial intelligence (AI), the Internet of Things (IoT), and renewable energy developments are also influencing consumer behavior to make more sustainable decisions (Geng et al., 2021; Jabbour et al., 2020). New opportunities for environmentally responsible living are being created by these technology advancements, particularly in the form of intelligent, energy-efficient goods and services.

One of the leading innovations in the sustainability space, electric vehicles (EVs), are a prime example of how cutting-edge technologies are changing consumer choices and

environmental behavior. A number of variables, including as favorable government legislation, heightened environmental consciousness, advancements in battery and charging technology, and shifting consumer perceptions of sustainability, are contributing to the broad adoption of EVs (Rezvani et al., 2015; Li et al., 2017). By encouraging product lifetime efficiency, cutting emissions, and optimizing energy use, these innovations also play a crucial role in the development of circular economies (Bocken et al., 2016).

Research Gap:

Although modern technologies are increasingly being incorporated into sustainable practices, little research has been done on how they directly affect consumer behavior. Current research mostly concentrates on the operational effectiveness or environmental advantages of technology, but it does not fully examine how these advancements influence consumer attitudes, choices, and adoption of sustainable practices (Gershoff & Frels, 2015).

- 1) Integration of Technology and Behavior:** Although innovations centered on sustainability, such as AI-powered energy solutions, smart home systems, and green manufacturing methods, are becoming more prevalent, little is known about how these technologies affect customer behavior (Bohnsack et al., 2014).
- 2) Adoption Barriers and Motivators:** Little is known about the reasons behind consumers' reluctance or excitement regarding the adoption of these technologies, especially in a variety of sociocultural and economic circumstances (Wilson et al., 2020).
- 3) Behavioral Changes in Response to Innovation:** Research frequently ignores the ways in which new technologies can result in long-lasting behavioral changes, such more brand loyalty or sustainable consumption patterns (Sheth et al., 2011).
- 4) Demographic and Cultural Nuances:** According to Kotler and Keller (2016), there aren't many empirical research that look at how consumer responses differ depending on demographics like age or cultural background and how marketing tactics should change correspondingly.
- 5) Strategic Implications for Marketers:** According to Wang et al. (2018), there aren't many well-defined frameworks that can assist marketers in bridging the gap between changing consumer sustainability preferences and technology innovation.

Research Objectives

- 1) To examine the influence of sustainability-oriented innovations (e.g., AI-enabled EV systems, IoT-based charging infrastructure) on consumer attitudes and behaviors toward electric vehicle adoption.**

- 2) **To identify key motivators and barriers** affecting consumer decisions to adopt electric vehicles in different sociocultural and economic settings.
- 3) **To assess whether electric vehicle usage leads to long-term behavioral shifts** such as a preference for sustainable transport and increased brand loyalty.
- 4) **To explore how demographic and cultural factors** (age, gender, income, education) influence consumer perceptions and adoption of electric vehicles.
- 5) **To propose a marketing and policy framework** that effectively bridges technological innovation and evolving consumer sustainability preferences in the EV market.

Research Hypothesis:-

A. Based on the demographic Influences on Feature Preferences

- 1) **H₀₁:** There is no significant difference in EV feature preferences between male and female respondents.
H₁₁: There is a significant difference in EV feature preferences between male and female respondents.
- 2) **H₀₂:** Age group does not significantly influence EV feature preferences.
H₁₂: Age group significantly influences EV feature preferences.
- 3) **H₀₃:** Income level does not significantly affect preference for smart or premium EV features.
H₁₃: Income level significantly affects preference for smart or premium EV features.

B. Based on the psychological and Behavioral Factors

- H₀₄:** There is no significant correlation between trust in EV technology and willingness to adopt EVs.
H₁₄: There is a significant positive correlation between trust in EV technology and willingness to adopt EVs.
- H₀₅:** Cost sensitivity has no significant effect on the intention to adopt EVs.
H₁₅: Cost sensitivity has a significant negative effect on the intention to adopt EVs.
- H₀₆:** There is no significant correlation between belief in advanced sustainability technologies and concern about battery lifespan.
H₁₆: There is a significant positive correlation between belief in advanced sustainability technologies and concern about battery lifespan.

C. Sustainability Perceptions and Policy Attitudes

H₀₇: Perceived environmental benefits of EVs do not influence support for government EV adoption policies.

H₁₇: Perceived environmental benefits of EVs positively influence support for government EV adoption policies.

H₀₈: Perceived inadequacy of charging infrastructure does not affect willingness to purchase EVs.

H₁₈: Perceived inadequacy of charging infrastructure negatively affects willingness to purchase EVs.

H₀₉: Awareness of government incentives does not influence attitudes toward EV adoption.

H₁₉: Awareness of government incentives positively influences attitudes toward EV adoption.

D. Factor Structure Validation

H₀₁₀: Consumer perceptions of EVs cannot be explained by two distinct factors.

H₁₀: Consumer perceptions of EVs can be explained by two distinct factors:

- (a) Perceived Benefits & Trust in EV Technology
- (b) Cost Sensitivity

2. Literature Review

Consumer Behavior Theories

To comprehend behavior prediction and intention, the Theory of Planned Behavior (TPB) has been widely used. Ajzen (2020) talked on its broad application in a variety of fields, emphasizing its capacity to explain decision-making, including the adoption of technology and sustainable practices. Ajzen (2020). Additionally, research like Paul et al. (2016) highlights the relevance of TPB for eco-conscious behavior by showing how well it predicts the use of green products. Paul and associates, 2016. In a similar vein, recent studies have extended the Technology Acceptance Model (TAM), a fundamental paradigm for researching technology adoption, to examine digital health and educational platforms. Liu & Ma (2023), for example, demonstrated the effectiveness of TAM in elucidating users' behavioral intentions when utilizing AI products. Ma and Liu, 2023.

Recent research has focused on integrating Value-Belief-Norm (VBN) theory and Norm Activation Model (NAM) to better understand behaviour related to sustainability, in addition to the Theory of Planned Behaviour (TPB) and the Technology Acceptance Model

(TAM). According to Steg and Vlek (2009), moral commitments and personal beliefs have a big impact on pro-environmental behaviour, particularly when it comes to highly involved decisions like buying electric cars (EVs). According to Stern (2000), sustainable transportation decisions can be influenced by personal norms that are triggered by awareness of the effects on the environment.

Furthermore, social impact and environmental concerns have been added to the Unified Theory of Acceptance and Use of Technology (UTAUT) to account for the adoption of green technologies. Hedonic motivation and enabling factors are particularly significant for EV users, according to Dwivedi et al. (2020), who showed the effectiveness of UTAUT2 in describing behavioural intentions connected to smart and green technology.

Studies on EV Adoption Trends

A combination of psychological and sociodemographic factors influence the adoption of electric vehicles (EVs). Madrid (2023) found that environmental awareness and income levels, in addition to obstacles such as a lack of suitable charging infrastructure, are important factors in the adoption of EVs. Madrid in 2023. Similarly, Jain et al. (2023) emphasized the necessity for customized approaches by highlighting issues including high upfront costs and policy inefficiencies in the Indian context. Jain and associates, 2023. Research also looks at adoption's psychological obstacles. Vieira et al. (2023) showed how people's preparedness to switch to sustainable transportation is limited by psychological inertia and competing objectives. 2023; Vieira et al.

A multifaceted view of EV adoption that encompasses psychological, economic, and infrastructure factors is highlighted by emerging studies. In a thorough analysis, Rezvani et al. (2015) found that perceived behavioural control, innovativeness, and environmental concern were important psychological determinants of EV purchase intention. On the basis of infrastructure readiness and regional policy frameworks, they did, however, also see notable variation.

Bansal and Kumar (2022) cited range anxiety, policy ambiguity, and ignorance as the main deterrents in the Indian context. They promoted more government incentives and open communication of information. Sovacool et al. (2018) emphasised the significance of lifestyle compatibility globally, demonstrating that adoption is higher among those whose daily habits correspond with the benefits and constraints of electric vehicles.

Technological Advancements in EVs

The expansion of the EV market has been propelled by technological advancements in battery performance and energy economy. In order to investigate the dynamics of the EV

industry, Khusanboev et al. (2023) used predictive analytics, emphasizing the significance of efficiency and range improvements for gaining the trust of consumers. Furthermore, Sarsia et al. (2023) emphasized that sustainable design and advancements in charging infrastructure are essential to the long-term scalability of EVs.

Innovation in technology has become both a catalyst and a barrier to consumer acceptance. Egbue and Long (2012) state that the most frequently mentioned technical issues influencing the adoption of EVs are still battery cost, energy density, and charging periods. However, developments like ultra-fast charging stations and solid-state batteries have the potential to improve customer attitudes (Tarpenning, 2021).

Future adoption scenarios are being mapped concurrently using AI-driven forecasting and machine learning. In order to demonstrate that technology advancement on its own is insufficient in the absence of systematic policy support and market alignment, Chaturvedi et al. (2023) used neural networks to model EV market adoption under alternative policy and cost frameworks.

3.Conceptual Framework Diagram

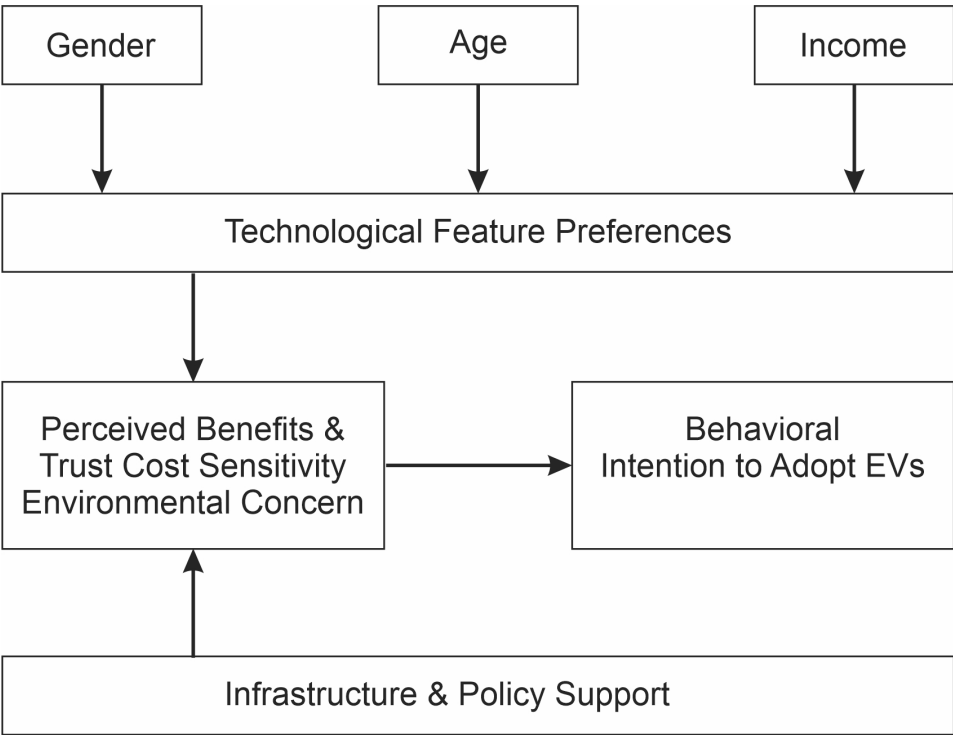


Fig 1: Conceptual Framework of EV

4. Data Analysis

1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid MALE	96	92.3	92.3	92.3
FEMALE	8	7.7	7.7	100.0
Total	104	100.0	100.0	

Table 1: Gender

Source: Primary data

The respondents' gender distribution is shown in the table. Of the 104 participants, 96 were men, making up 92.3% of the sample, and only 8 were women, making up 7.7%. The cumulative proportion, which reaches 100%, attests to the coverage of the entire sample.

AGE

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Below 25	48	46.2	46.2	46.2
25-34	56	53.8	53.8	100.0
Total	104	100.0	100.0	

Table 2:Age

Source: Primary data

The respondents' age distribution is shown in the table along with their opinions and preferences for electric cars (EVs). Of the 104 participants, 48 (46.2%) are under the age of 25, while 56 (53.8%) are between the ages of 25 and 34. This suggests that young individuals, mainly those aged 25 to 34, make up the bulk of responders. This demographic profile implies that younger people, who might be more tech-savvy, environmentally sensitive, and receptive to embracing new transportation technologies like electric vehicles, have a significant influence on opinions and attitudes toward EV adoption in this study.

Income_Level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Below Rs 50,000	96	92.3	92.3	92.3
Rs.50,000-Rs.1,00,000	8	7.7	7.7	100.0
Total	104	100.0	100.0	

Table 3:Income

Source: Primary data

The table displays the income-level distribution of respondents concerning their views on electric vehicles (EVs). A significant majority, **96 out of 104 respondents (92.3%)**, reported earning **below Rs 50,000 per month**, while only **8 respondents (7.7%)** fall into the **Rs50,000–Rs1,00,000** income bracket. This indicates that the study predominantly captures the perspectives of individuals from **lower-income groups**. Given the cost sensitivity typically associated with this segment, their attitudes toward EV adoption may be significantly influenced by the affordability and long-term economic benefits of electric vehicles. These insights are crucial for policymakers and manufacturers aiming to promote EVs among price-conscious consumers.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.759
Bartlett’s Test of Sphericity	Approx. Chi-Square	415.807
	Df	21
	Sig.	.000

Table 4: Factorial Validity by KMO and Bartlett’s Test

Source: Primary data

A Principal Component Analysis with varimax rotation was conducted to identify underlying factors influencing consumer perceptions of electric vehicles (EVs). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.759, indicating suitability for factor analysis. Bartlett’s Test of Sphericity was significant ($\chi^2(21) = 415.807, p < .001$), supporting the presence of correlations among items.

	Component	
	1	2
Factor 1: Perceived Benefits & Trust in EV Technology		
High upfront cost	-.104	
Limited availability of charging infrastructure.	.681	
Concerns about battery lifespan.	.996	
Lack of government incentives	.921	
Factor 2: Consumer Attitudes and Behaviors		
I believe advanced technologies make EVs more sustainable.		.097
I am willing to pay a premium for products that contribute to sustainability.		.708
I trust that EVs will play a significant role in the circular economy.		.297
Extraction Method: Principal Component Analysis.		
Rotation Method: Oblimin with Kaiser Normalization.		
Rotation converged in 5 iterations.		

Table No.5: Loading of scale items on factors by Rotated Factor Matrix

Two components were extracted, accounting for 72.43% of the total variance:

- **Factor 1:** “Perceived Benefits & Trust in EV Technology”, accounting for 56.47% of the variance, included variables such as belief in technological sustainability, concerns about charging infrastructure and battery lifespan, and trust in EVs’ role in the circular economy.
- **Factor 2:** “Cost Sensitivity”, explaining 15.96% of the variance, was primarily represented by the perceived high upfront cost of EVs.

These findings suggest that while consumers value the environmental and technological benefits of EVs but cost remains a distinct and significant barrier to adoption

	Perceived Benefits & Trust in EV Technology	Cost Sensitivity
Perceived Benefits & Trust in EV Technology	1	
Cost Sensitivity	0.403	1
Extraction Method: Principal Component Analysis.		
Rotation Method: Oblimin with Kaiser Normalization.		

Table No.6: Correlation Matrix

Table No. 4’s correlation matrix shows how the variables “Cost Sensitivity” and “Perceived Benefits & Trust in EV Technology” relate to one another. These two variables have a somewhat good association, as indicated by their correlation coefficient of 0.403. This implies that there is a moderate propensity for people to become more cost sensitive as perceived advantages and confidence in electric vehicle (EV) technology rise. Put another way, buyers who are more aware of the benefits and who have greater faith in EV technology might nevertheless be aware of the financial ramifications. When factors are presumed to be associated, the Principal Component Analysis extraction method and the Oblimin with Kaiser Normalization rotation method are employed.

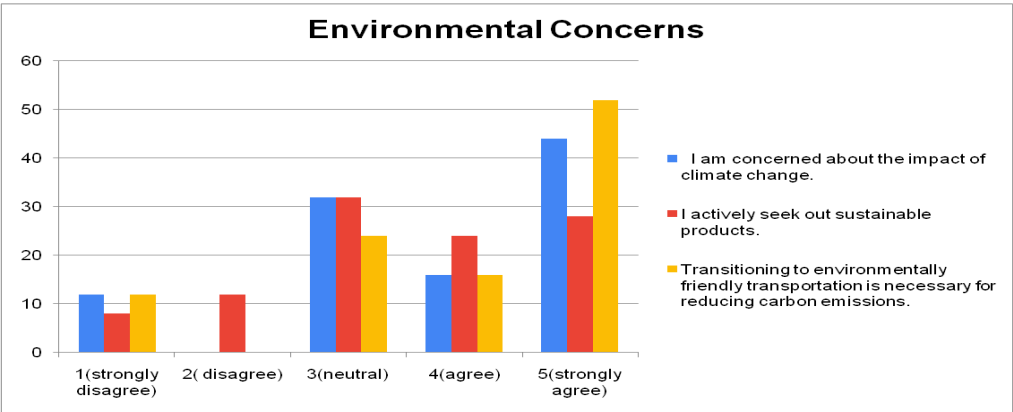


Fig 2 :Environmental concerns displayed

The graph below illustrates the distribution of technological feature preferences between male and female respondents. Both genders show high preference for Fast Charging and Enhanced Battery Range. Smart Driving Assistance is slightly more favored by males. Connectivity Features are selected similarly by both. While core features like charging speed and range are universally appealing, males show a marginally higher interest in smart tech (assistance features). This indicate a gender-based variation in enthusiasm for autonomous or semi-autonomous features.

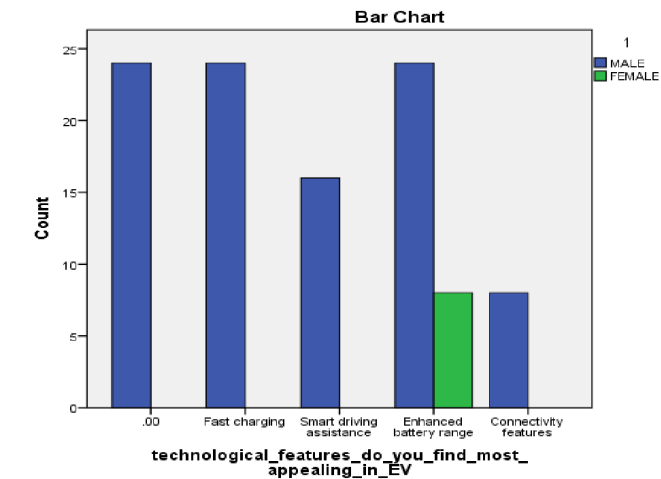


Fig 3: Technology feature vs gender

The graph below compares how different age groups rate various EV technological features. Younger respondents (e.g., under 30) show higher interest in Connectivity Features and Smart Assistance. Older respondents seem more focused on Battery Range and Charging Speed. Digital native age groups prioritize integration and automation, whereas older consumers may prioritize practical features like longer range and faster charging, aligning with a usage-driven mindset.

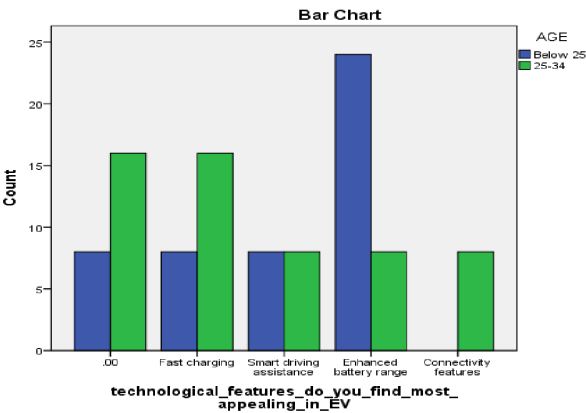


Fig 4: Technology feature vs age

The below graph shows how EV feature preferences vary by income level. Higher-income groups prefer advanced features such as Smart Driving Assistance and Connectivity. All income groups show interest in Fast Charging and Battery Range, but less variation here. Income may influence interest in premium or “smart” features — those with higher disposable income may value innovation and tech integration more. Meanwhile, efficiency-related features are universally desirable.

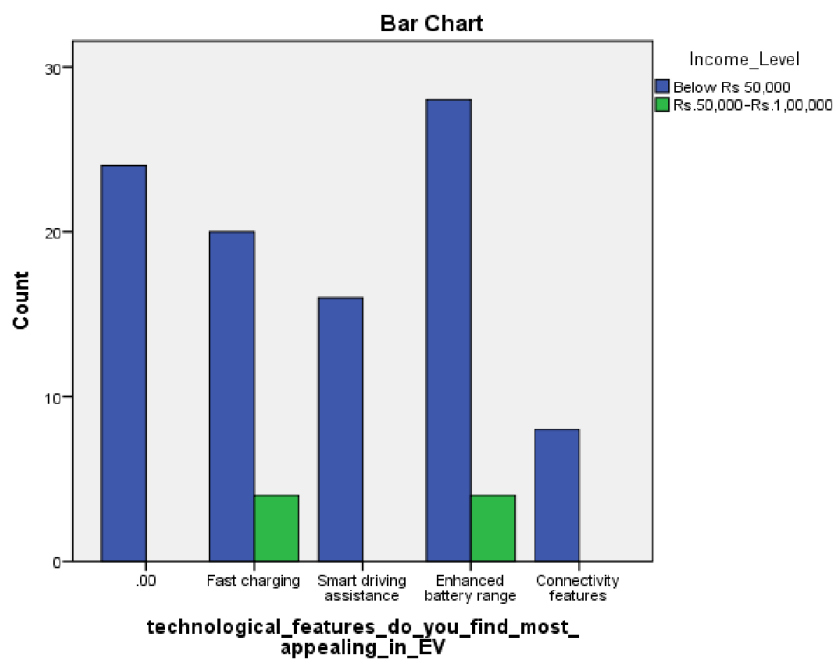


Fig 5: Technology feature vs income

The distribution of respondents’ preferences for technological features in electric cars (EVs), broken down by income level, is depicted in the bar chart. “Enhanced battery range” is the most desirable feature across all income levels, especially for those making less than Rs50,000, indicating a significant desire for extended driving range between charges. To a lesser degree, this lower-income demographic also favors smart driving assistance and fast charging. Although they are much less represented, respondents in the Rs50,000–Rs1,00,000 income category also expressed some interest in faster charging and longer battery life. In both income ranges, the least preferred features are those like connectedness. According to these results, most buyers, particularly those with low incomes, choose functional and performance-enhancing aspects like battery life and charging efficiency over luxuries or convenience-based EV innovations. This knowledge can help marketers and manufacturers adjust EV features and messaging to appeal to consumers on a tight budget.

Correlations

		Concerns about battery lifespan.	I believe advanced technologies make EVs more sustainable.
Concerns about battery lifespan.	Pearson Correlation	1	.764**
	Sig. (2-tailed)		.000
	N	104	104
I believe advanced technologies make EVs more sustainable.	Pearson Correlation	.764**	1
	Sig. (2-tailed)	.000	
	N	104	104

** . Correlation is significant at the 0.01 level (2-tailed).

Table 7:-Concerns about battery lifespan correlated to
Belief that advanced technologies make EVs more sustainable

The open-ended question “What additional features or policies would encourage you to adopt an EV?” has the following responses ” Advance features, More battery capacity, More battery range , Repair problems, Quick charging capabilities (e.g., 30 minutes to 80% charge) would make EVs more convenient, “Financial Incentives, Charging Infrastructure Expansion”.

According to the comments, the main concerns of prospective EV adopters are affordability, convenience, and technological performance. In particular:

a. Improved Battery Life and Advanced Features:

Improved technological characteristics, including better automation or connectivity, are of appeal to participants.

Increased battery capacity and range are highly desired, indicating that “range anxiety” is still a major adoption hurdle.

In order to match EV use with consumer expectations for ease comparable to that of conventional vehicles, quick charging capabilities—such as charging to 80% in 30 minutes—are considered crucial.

b. Issues with Repair and Maintenance:

Some responders bring up “repair problems,” expressing concerns about the dependability of EV systems, the availability of skilled technicians, or after-sales care.

c. Policy and Financial Incentives:

It is noted that financial incentives—like tax exemptions, subsidies, or lower registration costs—are significant motivators.

Since EVs are frequently thought of as expensive up front, respondents are looking for additional financial reasons to invest in them.

d. Extension of Charging Infrastructure:

Widespread and sufficient infrastructure for charging is deemed essential. EV adoption may stagnate in the absence of easy access to charging stations, particularly for individuals without private parking.

The open-ended question “In your opinion, how can EVs contribute to a sustainable future?” has the following responses: “By providing less price, protection of UV zone, Eva reduce the pollution and high usage of fuel, repair problems, increase renewable Energy Sources: Ensure a significant portion of the energy used to charge EVs comes from renewable sources, Reduced greenhouse gas emissions, Renewable energy integration. Sustainable transportation, Closed-loop recycling, Pollution free can avoid toxic environment “

According to the results, consumers view electric vehicles (EVs) as significant contributors to sustainability because of the following:

a. Environmental Advantages:**Lower Emissions and Pollution:**

EVs can assist lower air pollution and greenhouse gas emissions, which are important for reducing climate change and enhancing public health, according to several respondents.

The claims that EVs can greatly lessen urban environmental degradation are reflected in phrases like “pollution free” and “avoid toxic environment.”

Keeping the Ozone Layer Safe:

EVs may help minimise dangerous emissions that influence atmospheric layers, according to references to the “Protection of UV zone,” which is interpreted as the ozone layer.

b. Energy Efficiency and Renewable Energy Integration:**Utilising Renewable Energy Sources**

In order to maximise sustainability, a number of comments stress how crucial it is to charge EVs using renewable energy sources like solar or wind.

EVs’ contribution to a low-carbon future is strengthened when they are integrated into a renewable energy system.

Support for the Energy Transition:

In order to make energy consumption more sustainable over time, EVs are viewed as instruments for moving away from heavy reliance on fossil fuels.

c. Waste Reduction and the Circular Economy:

Closing the loop on recycling:

The reference to “closed-loop recycling” indicates understanding that, in order to reduce waste and environmental effect, EVs—including their batteries—should be a part of a sustainable product lifetime.

d. Social and Economic Aspects:

Accessibility and Affordability

One respondent associates sustainability with affordability, suggesting that increasing EVs’ affordability may encourage wider adoption and, consequently, a larger environmental impact.

Considerations for Maintenance and Repair:

Despite being a primary worry, the reference to “repair problems” also suggests that durability, reparability, and serviceability—all of which reduce electronic waste—must be a part of a sustainable EV future.

5. Future Scope:

The study identifies a number of directions for further research and useful use. In order to comprehend larger viewpoints, future study can broaden to include more different demographic groups, such as people from rural locations or higher income levels. Furthermore, as EV infrastructure and technology advance, longitudinal studies could monitor shifting attitudes. In order to attract cost-conscious customers, industry cooperation may also be able to investigate cost-cutting measures, especially for battery technology and charging infrastructure. Future research might also examine the psychological obstacles to EV adoption, including as risk perception and technology confidence, and evaluate the efficacy of legislative tools like public awareness campaigns and subsidies. Lastly, a crucial component of research on sustainable mobility may be the incorporation of renewable energy sources into EV charging infrastructure and the assessment of their influence on consumer choice.

6. Conclusion:

The study thoroughly investigates consumer attitudes, inclinations, and worries regarding the uptake of electric vehicles (EVs), especially in the Indian setting. According to the research, electric cars are becoming more and more popular as a practical and ecological form of transportation, particularly among younger people (ages 25 to 34), who are typically more open to new technology and environmental causes. Nevertheless, the study also identifies important obstacles that still prevent broad adoption, albeit the generally favorable opinion.

One important finding of the factor analysis was the identification of two significant factors that impact consumer attitudes: “Cost Sensitivity” and “Perceived Benefits & Trust in EV Technology.” The former shows faith in EVs’ technological capabilities, environmental benefits, and compatibility with the circular economy. Numerous attendees conveyed hope regarding EVs’ potential to lower pollution, encourage the integration of clean energy, and facilitate a sustainable transportation ecology. However, the latter highlights a recurring issue—high upfront costs—that is especially noticeable among responders from lower-income groups. Even those who are generally technologically and environmentally conscious seem to be greatly influenced by this budgetary limitation when making purchases.

The data also shows that demographic variables like wealth, age, and gender influence consumer preferences. Although everyone appreciates features like quick charging and extended battery life, younger and wealthier demographics are more likely to be interested in cutting-edge technologies like smart driving assistance and connectivity functions. These findings are further supported by open-ended comments, which highlight the need for better repair and maintenance services, faster charging infrastructure, and larger battery capacity. Furthermore, policy recommendations like tax breaks, government subsidies, and wider public charging stations are thought to be essential for facilitating widespread EV adoption.

From a wider angle, respondents think that by reducing greenhouse gas emissions, decreasing reliance on fossil fuels, and facilitating the switch to renewable energy systems, EVs may significantly contribute to environmental sustainability. In order to reduce electronic waste and maintain long-term ecological balance, some additionally emphasized the significance of closed-loop recycling and repairability.

In summary, the shift to electric vehicles is accelerating, but it calls for a coordinated and inclusive strategy. Even though environmental consciousness and technical advancement are rising, post-purchase assistance, infrastructural preparedness, and cost are still important issues that require attention. To fully realize the potential of electric vehicles in promoting a sustainable future, these gaps must be closed by industry cooperation, legislative initiatives, and ongoing consumer education.

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NATURE AND EXTENT OF WEB BASED VOLUNTARY NON FINANCIAL CORPORATE REPORTING

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ABSTRACT

Corporate Disclosure is the process of providing information to various interested users for their decision-making needs regarding the sources and performances. 30 % of large companies use the internet for non financial disclosure. The development of Internet technology has given businesses a new channel for informing their stakeholders about their operations. Researchers have been interested in non financial disclosures. The reason why businesses continue to give non financial information because of ever-increasing legal requirements has drawn a lot of attention. This is what motivated to conduct research on corporate web non financial disclosure keeping in mind the requirement of fast changing era.

Therefore, an attempt has been made to shed light on the extent and nature of non financial corporate web reporting by Indian Companies. 8 key categories were used to judge the non financial content available on websites of Indian companies namely HRI; RTI; GI; CGI; MI; CSR; TAUS and IRI.

Keywords: Disclosure, Information, Non-financial, Reporting.

Introduction

Corporate Disclosure is the process of providing information to various interested users for their decision-making needs regarding the sources and performances (Kaur and Singh, 2019). Stakeholders can receive information through a variety of sources. Companies typically use print media like hard copy, annual reports, newspapers, etc. to inform stakeholders. Annual reports typically include a balance sheet, director's report, chairman report and Statistical

Tables, the Auditor's Report, the Profit and Loss Account and other statements that provide giving users both financial and non-financial information. However, due to technological advancements, the Additionally, reporting procedures have moved from print media with a small audience to online disclosure with a large user base.

Corporate reporting or corporate disclosure is the process through which companies disseminate both financial and non-financial information to various interested parties and avoids information asymmetry. Disclosure of the corporate reports assists organizations in achieving various financial accounting objectives. It assists large number of stakeholders to allocate financial resources in an effective manner and helps the investors in assessing the investments prospects and to decide about their investment in a particular company. It becomes base for accurate analysis of risk and return being attached to investment opportunities (Subramanyam and Dasaraju, 2014).

1.1 Corporate Reporting

Corporate reporting applies to the reporting parts of presentation and disclosure. This requires diversified reports, budget summaries, corporate administration, supportability report etc. as far as old method of data presentation are concerned. However, with the revolution in Internet, presenting data for the welfare of stakeholders has been converted into online modes. Nowadays, web reporting is being used by several companies as a medium for disclosing financial and non-financial aspects is growing at a rapid rate throughout the world. According to Cook (1999), "As far as internet usage is concerned for disclosing financial and non financial aspects, 30 % of large companies use the internet for non financial disclosure". It may be

claimed that the Internet is the ideal platform for communicating with stakeholders in the modern world.

1.2 Websites Must Comply with SEBI Disclosure Requirements for Web Reporting:

Clause 46 (1): Every listed entity must maintain a working website that contains all the necessary information.

Clause 46 (2) (a) and (f): It states that every company must publish complete information about its business on its website.

Clause 46 (2) (a): states that every publicly traded firm must publish the makeup of its board of directors committee on its website.

Clause 46 (2) (j) and (k): The appointed officials' email and other contact information for grievance redress.

Clause 46 2 (l): The financial information, which includes the notice of the board meeting, financial results, the full annual report, which includes the balance sheet, profit and loss account, director report and corporate governance report.

Clause 46 (2) (m): The listing entity's shareholding structure for the financial year.

Clause 46 (2) (o): Disclosure of the entity's analyst or institutional investor meeting calendar, as well as any presentations made to analysts or institutional investors.

Clause 46 (3) (a): The entity is responsible for ensuring that the information on the website is accurate.

2. Review of Literature

Sabelfeld (2011) tried to investigate the corporate disclosures made available by businesses via their websites for investors. It was tried to learn what kinds and how much information businesses posted on their websites for investors. The authors discovered variances in the quantity and nature of disclosure given by each firm by using a self-developed disclosure index and examining the reports of 30 companies listed in the UK (London Stock Exchange), Sweden (OMX Stockholm) and Japan (Tokyo Stock Exchange). **Al-Htaybat (2011)** tried to investigate the state of corporate online reporting in Jordan for the year 2010 and to explain it using the traits of the companies. For the investigation, a sample of 272 Jordanian stock exchange-listed businesses was chosen. Results were analysed using exploratory factor analysis. The findings showed that 175 out of 272 businesses have open and functional websites. 70 percent of company reporting was done online on average. Corporate online reporting showed variations that were related to company size, performance, foreign ownership and online user familiarity. **Bhayani (2012)** disclosed the corporate disclosure policies of listed non-financial enterprises in India. Based on a sample of BSE 100 companies from 2008–2009 to 2010–2011, the analysis was conducted. In order to examine the level of corporate disclosure and its relationship with corporate characteristics such as size, profitability, leverage, listing status, shareholding pattern, audit firm, residential status of a firm, age of the sample companies, an unweighted disclosure index with 74 reporting items was applied to sample firms. There was a substantial correlation between listing status, promoter shareholding pattern, leverage, size of audit firm, and profitability, according to the results of the pearson correlation matrix and multiple regression analysis. However, no correlation between age and the firm's residential status was discovered. **Hossain et al., (2012)** investigated how companies in Qatar voluntarily revealed financial and non-financial information. The further objective was to investigate the relationship between corporate traits and the voluntarily shared online financial and non-financial information based on industry type. The sample included 42 businesses that are listed on the Qatar Exchange, the only stock exchange in Qatar. To determine whether voluntary information

sharing on the Internet was associated with firm age, size, profitability, complexity, existing assets and liquidity, an ordinary least regression was conducted. Age, profitability and liquidity were found to be unimportant factors in describing the level of internet financial reporting disclosure, whereas firm size, existing assets and business complexity were found to be significant factors. **Nandi and Ghosh (2013)** investigated the relationship between corporate governance principles, business characteristic and the extent of corporate disclosure of listed companies in India. For the aim of the study, 60 companies that were listed on the Bombay Stock Exchange (BSE) or National Stock Exchange (NSE) between 2000–2001 and 2009–2010 comprised the sample. The Standard & Poor's (2008) model was utilised in the study to gauge the degree of corporate disclosure. A positive correlation between board size, the proportion of audit committee members to all board members, family control, CEO duality, firm size, profitability, liquidity and the degree of corporate disclosure was suggested by the findings of multiple regression. However, it was discovered that board composition, leverage and business age were inversely correlated with the level of corporate disclosure. **Aqel (2014)** found how Turkish companies registered on the Istanbul Stock Exchange used the Internet for financial reporting (ISE). Further, the relationships between important business characteristics that were included in Turkish enterprises' online financial reporting was examined. The sample for the study consisted of 263 publicly traded Turkish companies registered on the Istanbul Stock Exchange. The study's findings were examined using descriptive analysis, multicollinearity analysis and regression analysis. According to the study's findings, four independent variables size, leverage, profitability and liquidity were the ones that were most frequently revealed in online financial reports. The research also showed that the disclosures made in online financial reports were highly influenced by the firm's size and profitability factors. **Turmin et al., (2015)** investigated the practises of corporate online reporting by Malaysian listed corporations, performed a study. The study's sample included 380 publicly traded companies. By detecting the presence of corporate internet reporting attributes on the websites of the companies under investigation, data for corporate internet reporting practice was gathered and evaluated using descriptive statistics. The results revealed that 82% of the businesses under investigation had websites and used corporate internet reporting. An average of 28.9% of the corporate internet reporting attributes were used by Malaysian listed businesses. According to the results by industry type, the plantation sector had the highest mean scores for overall corporate internet reporting, investor relations and user support. The finance sector had the highest mean scores for the categories of accounting and finance, technological advantage and the construction sector which revealed the highest mean scores for forward-looking data. **Kuruppu et al., (2015)** investigated how publicly traded companies on the Colombo Stock Exchange (CSE) in Sri Lanka use the internet as a medium for the voluntary communication of financial information. For the objective of the study, the 244 companies from 20 different

industry sectors that are listed on the CSE were examined. The likelihood ratio, pearson chi-square test and percentage analysis all showed that financial reporting on the internet is still in its infancy in Sri Lanka. Even though 59 percent of businesses have websites, just 43 percent of them use them to share financial data. According to the findings of a pearson chi-square test, although many other reporting formats are used for financial reporting on the internet, PDF is the most popular one, being used by 92 percent of CSE listed businesses. **Kamaruzaman et al., (2019)** found that the relationship between management ownership, institutional ownership, family ownership and corporate risk disclosure was significant. The connection between company value and corporate risk disclosure was also examined. This study demonstrated how institutional ownership affects corporate risk disclosure by using text analysis on the annual reports of 200 top publicly traded companies over a two-year period. This study also demonstrated that corporate risk disclosure has an adverse impact on firm value since it is more expensive to report than it is to prepare the necessary information. **Nagarajah and Alagathurai (2021)** studied the effect of corporate internet reporting on business performance. The results of the content analysis showed that corporations disclosed content elements at a rate of around 77.3%, compared to presentation elements at a rate of about 57.6%. The regression analysis's findings also showed a strong positive correlation between return on assets and the content element disclosure. The appearance element and the content element, however, did not significantly correlate with return on assets.

3. Need of the Study

3.1 CIR Practices in India

The development of Internet technology has given businesses a new channel for informing their stakeholders about their operations. The general public now finds it simpler to use the financial and non-financial information on websites. Users can obtain low cost solutions, immediate access, mass communication, flexibility, access to larger volumes and benefits of multimedia communication through the internet. Currently, using the internet for business reporting is a well-known technique. The users find it useful as they can gather comprehensive information from websites at once.

Researchers have been interested in non financial disclosures. The reason why businesses continue to give non financial information because of ever-increasing legal requirements has drawn a lot of attention. This is what motivated to conduct research on corporate web non financial disclosure keeping in mind the requirement of fast changing era.

Therefore, an attempt has been made to shed light on the extent and nature of non financial corporate web reporting by Indian Companies. The following 8 key categories are being used to judge the non financial content available on websites of Indian companies.

Human Resource Information(HRI);

a) Right To Information(RTI);

b) General Information(GI);

c) Corporate Governance Information(CGI);

d) Marketing Information(MI);

e) Corporate Social Responsibility(CSR);

f) Technological Aspects and User Support(TAUS);

g) Investor Related Information(IRI);

A brief description of these ten variables is given below:

- **Human Resource Information (HRI)** - This criteria estimates the substance of human resource information that is available on the website, including the proportion of women, the number of permanent employees, employee training, recruitment policy, employee welfare schemes, employee empowerment/involvement, employment/career opportunity, fringe benefits and employability.
- **Right to Information Act (RTI)** – The Right to Information Act (RTI) looks at the accuracy of the data made available under the RTI Act of 2005. Every publicly traded company is required to post at least some basic information online. The information under RTI varies from company to company, but typically includes a link to RTI from the homepage, a special section for RTI, the names and contact details for the CPIO (Chief Public Information Officer) and the CAPIOs (Central Assistant Public Information Officers), as well as details about the organisation and the information needed to comply with section 4(1)(b) of the RTI Act.
- **General Information (GI)** - This category includes criteria like About Us, Head and Regional Offices, Policies, Site Map, Terms & Conditions, Search Box, Contact Us, Gallery, News Summaries, Helpline, Language Version (English, Hindi & Other), Current Date, Current Time, Current Day, Latest Stock Price on Home Page, Follow Us, Awards and Calculators.
- **Corporate Governance Information (CGI):** The availability of corporate governance information on the internet was examined in this category. The company's philosophy, mission, history, ownership structure, board of directors (Names and Profiles), executive officers, audit committee members, remuneration policy, MOA, AOA, code of conduct, citizen's charter, board committee, risk discussion and disclosure, key management personnel and other information was all covered in detail.

- **Marketing Information (MI):** It is information about products and services, advertising of one's own goods and services, contact points, media contacts, terms and conditions of purchases, notices of sales and purchases, information on tenders, the company's primary product line and order monitoring.
- **Corporate Social Responsibility (CSR)** - It assessed the degree of social responsibility exhibited and disclosed by an organisation, including donations to charitable organisations, social empowerment and welfare, education-related initiatives, community health-related initiatives, promoting sustainable livelihood activities, rural infrastructure-related initiatives, skill development and preservation of national heritage.
- **Technological Aspects and User Support (TAUS)** – This criterion examined the use of sophisticated technological tools by the company to enhance the website's usability and keep it up to date. It has information like a page divided into frames, the most recent announcements/news, a single-click access to financial information, a single-click access to investor relations page and a single-click access to product and service information. It also deals with the various digital formats of annual Reports. Website sitemap, screen reader access, online feedback form, link to parent or subsidiary, privacy and copyright policies, Glossary, company blogs, easy access, FAQs, provider information, animated graphics, visitor counter, last update date, provider information are also part of this criteria.
- **Investor Relations Information (IRI):** It is a measure of a company's availability of investor relations contact information, including name, email, postal address, phone number, shareholding pattern, dividend information, AGM information, investor presentation, financial highlights/ratio analysis, report downloading, annual report version, announcements/notices, latest stock price, frequently asked questions, share key data and bond & credit rating information.

4. Database and Research Methodology

The type and extent of voluntary non-financial disclosure made by Indian businesses online are evaluated in this section. For the analysis of Internet-based voluntary disclosures in the selected companies, 200 BSE entities were examined.

Table 1: Maximum Possible Scores of Disclosure Index

Categories in Disclosure Index (Dependent Variable)	Maximum Possible Score
Human Resource Information(HRI)	6
Right To Information(RTI)	5
General Information(GI)	5
Corporate Governance Information(CGI)	5

Marketing Information(MI)	5
Corporate Social Responsibility(CSR)	10
Technological Aspects and User Support (TAUS)	10
Investor Related Information (IRI)	7
Voluntary Non-Financial Disclosure Index(VNFDI) (Total of GI + CSRI+ CGI+ HRI+MI +IRI+ RTI+TAUS)	43

Note: The disclosure index was calculated based on the number of companies that disclosed specific item on their website.

5. Analysis and Discussion

5.1 Internet-based Voluntary Non Financial Disclosures in Selected Companies

The following section provides the detailed information of the various indicators of corporate web disclosure.

- Information on human resources (HRI)**

HRI aids in understanding the company's strengths in term of employees. Human resources are the real assets of any organization which helps in increasing the productivity and profitability. The culture of an organization can be developed, reinforced, or changed with the use of human resources.

HR is responsible for several crucial aspects of organizational culture, including compensation, performance management, training and development, hiring and onboarding and reinforcing company values. This criterion includes the number of employees, recruitment policy, employee's welfare schemes, fringe benefits, ratio of women employees, number of contractual policy, employee with disability etc.

Table 2: Item-wise Voluntary Disclosure of HRI

Sr. No.	Items	Disclosure Score	%
1	Number of permanent employees	178	89
2	Employee training	131	65.5
3	Recruitment Policy	129	64.5
4	Employee welfare schemes	194	97
5	Employment/Career opportunity	190	95
6	Number of contractual employees	99	49.5
	Disclosure Score	921	
	Maximum Score	1200	
	Percentage	76.75	

- i. **Number of permanent employees:** Number of permanent employees mean those employees whose services are permanent in nature. The table shows that 89 % companies disclosed about the number of permanent employees on website.
 - ii. **Employee training:** Employee training and development refers to an organization's ongoing attempts to improve its employees' performance. Employers use a variety of educational techniques and initiatives to train and develop their workforce. Training and development have been increasingly important as part of strategy during the last few years. More business owners are realizing the need of investing in employee training and development because it not only keeps employees motivated but also helps the company establish a highly competent staff. 65.5% companies disclosed their employee training on the website.
 - iii. **Recruitment policy:** A recruitment policy is a set of guidelines that creates a standard for all of your company's recruitment tactics and activities. An effective recruitment strategy should guarantee consistency, uniformity and compliance, particularly with regard to labour laws and regulations. Only 64.50 % companies disclosed their recruitment policies on the webpage.
 - iv. **Employee welfare schemes:** The word "employee welfare" refers to both the physical and mental well and wellbeing of staff. This can include their actual working conditions as well as other elements within and outside the office that have an impact on their standard of living, physical and mental health and ultimately, how well they perform at work. Initiatives for employee wellbeing are intended to reduce absences from work due to illness or injury and to support and encourage better attitudes and lifestyles that will improve every element of the employee's life. 97% companies presented the employee welfare schemes on website.
 - v. **Career opportunity:** Any opportunity that move you closer to your career objectives are referred to as career opportunities. This could be a position, an internship chance, or a training programme that advances the career of employee. 95% companies show employment opportunities.
 - vi. **Contractual employer:** A contract is a legally binding agreement that specifies the terms of completing work for a specific sum of money. Contractual employees are those persons who are on the job for certain period of time. According to table 49% of businesses made their contractual staff count available online.
- **Right to Information Act (RTI)**

The Right to Information Act is an effort to improve openness, give citizens more authority and make public bodies more accountable and responsible. Any person has the right to access

any information from any organization under the RTI Act. Therefore, public institutions are required by the RTI Act to post a certain amount of information online. Following table shows the web reporting data under right to information act to be followed by companies.

Table 3: Item-wise Voluntary Disclosure of RTI

Sr. No.	Items	DisclosureScore	%
1	Link to RTI from homepage	44	22.00
2	Special section for RTI	48	24.00
3	Name and Contact details of CPIO	28	14.00
4	Name and Contact details of AA	24	12.00
5	Details about the organization	114	57.00
	Disclosure Score	258	
	Maximum Score	1000	
	Percentage	25.8%	

- i. **Link to RTI from home page:** Through this link, RTI applications/first appeals can be filed by stakeholders by all the investors. 22% of the 200 companies in the survey have links to RTI on their homepages.
- ii. **Special section for RTI:** Some companies present a special section on RTI on their websites. All RTI received and replies given to them are presented under special section. Only 24% of businesses had a specific Right to Information Act component on their website.
- iii. **Central Assistant Public Information Officers (CAPIO):** It is an officer which keeps watch on the companies related to timely reply against RTI filed by any stakeholders. Company needs to mention the name and address of its CAPIO. Names and contact information for CPIOs has been mentioned by only 14.5%.
- iv. **Administrative Assistant:** This officer helps to manage the RTI queries. HE works under the CAPIO and assists him in handling all the queries. Names and contact information for AA has been mentioned by only 12.0%.
- v. **Detail about organization:** An organization is a group of people who cooperate, such as a firm, neighborhood association, charity, or union. A Company need to give information regarding its historical background, directors, growth etc. The companies provide information (57%) on the websites about the roles and responsibilities of the officers and employees, the salaries of the employees and a request form for information requests.

- **General information (GI):** These characteristics address online problems with financial reporting or information dissemination. General information includes the vision, mission, values of a company, background history, strategies, ratings and organization chart which displays the relationship between responsibility and authority. GI offer online help to various interested people in a variety of ways as before investing money, every investor wants some background information about company and its evolution over the period.

Table 4: Item-wise Voluntary Disclosure of GI

S.No.	General Corporate Information	No. of Companies Disclosing an item	Disclosure Score (%)
1	Back ground or history of organization/ corporate profile	195	97.5
2	Products and services information	193	96.5
3	Awards and recognitions	163	81.5
4	Vision and values	122	61
5	Mission	136	68
	Disclosure Score	809	
	Maximum Score	1000	
	Percentage	80.9%	

- Corporate Profile:** Company should create a profile and use it as a marketing tool if it wants to make a good impression on investors and attract customers towards new firm. A corporate profile, by definition, is a formal introduction of the company that tries to educate the audience about its goods and services. Alternatively, it can be described as the firm's history, structure, resources, performance rate and reputation. Table reports that 97.5% of businesses provide information about the background of the company and presents historical background. These provide information about their regional, offices and branches.
- Products and services information:** A service is an intangible good that results from the labour of one or more people, whereas a product is a tangible good that is placed on the market for purchase, consideration, or consumption. Companies need to express the information of products and services it is producing. On 96.5% of websites, information about products & services is shown.

- iii. Awards and Recognition:** For recognizing an organization's achievements through verbal and nonverbal cues, rewards are material benefits. Under this sub head, information about awards and recognition given by any government or non-government institute is given. On 81.5% of websites, information about awards and recognition is shown.
- iv. Vision and Values:** An organization's guiding principles are encapsulated in its vision and values statements. The vision statement describes what the business aspires to do or be in the future. The organization's fundamental beliefs and ethics are reflected in the values statement. When taken as a whole, these statements give an organisation a strategic orientation that informs both present and future business plans. 61% websites present the detailed information about the vision, values of their business.
- v. Mission:** A mission statement is characterized as an action-based declaration of an organization's goal and its approach to serving customers. This can occasionally include an explanation of the business, what it does and its goals. The objective of business is succinctly summed up in mission statement. A mission statement perfectly explains the "what," "who," and "why" of your business. The best mission statements serve as a company's operating manual. 68% websites provided the information of mission drafted by a company.

Information on Corporate Governance (CGI)

The framework that guides and regulates corporations is known as corporate governance. The Business Governance framework outlines the division of duties, responsibilities, norms and practices for corporate relations among various stakeholders, including the board, management, investors and others. The use of CGI at sampled few companies has been investigated using the criteria listed in Table.

Table 5 :Item-wise Voluntary Disclosure of CGI

S.No.	Corporate Governance Information	No. of Companies Disclosing an item	Disclosure Score(%)
1	Names of board of directors	200	100
2	Board committees	200	100
3	Corporate governance report	200	100
4	Director's report	200	100
5	Code of conduct and ethics	186	93
6	Remuneration policy	196	94
7	AGM Notice	188	94
8	Voting results of AGM	153	76.5

9	Articles of association	92	46
10	Memorandum of association	65	32.5
	Disclosure Score	1680	
	Maximum Score	2000	
	Percentage	84%	

- i. **Names of Board:** A board of directors is an executive body that jointly oversees the operations of an organization. This organization can be for-profit or nonprofit, such as a business, nonprofit organization or government agency. The board is also referred to simply as the “board.” The number of board members, the process for selecting them and the frequency of their meetings may all be specified by these authorities. An organization with voting members has a board that answers to and may be subordinate to the complete membership, who typically elects the board members. On their websites, each company included information on its ownership structure, board of director names and biographies, executive officers, audit committee members etc.
- ii. **Board committee:** A board committee is a small working group made up of board members that has been established by the board to support the board’s operations. Typically, committees are created to carry out some expert task. Members of the committee must possess knowledge of a certain field. Typically, committees are created to enhance board performance, effectiveness and efficiency in more specialized way. 100% companies have given the information related to the board committee.
- iii. **Corporate governance reports:** Corporate governance reports is a collection of rules and regulations to be followed by an organization. All the employees and those persons who directly deals with company must abide these rules and regulations. All sampled webistes have presented corporate governance report on their websites.
- iv. **Director’s report:** Big corporations are required to provide a directors’ report as a financial document at the conclusion of the fiscal year. Private limited firms are also required to submit a set of financial reports known as statutory accounts at the conclusion of each accounting year. The directors’ report summarizes the financial health of the firm and is produced by the board of directors. Given websites presented the director’s report on its websites.
- v. **Code of Conduct:** A code of conduct is more comprehensive and offers a set of values that influence staff members’ perspectives and decision-making. In addition to providing guidelines for a company’s ethics, a code of conduct also outlines precise expectations for employee behaviour. In real life, a code of conduct may consist of general principles or detailed regulations. For instance, a code of conduct can specify how staff members should act in order to support the organization’s overall objective,

but it can also provide rigid rules pertaining to internal activities, such as a dress code or break policy. 93% websites provide rules and regulations to be followed by employees after recruitment

- vi. Remuneration Policy:** The overall compensation an employee receives is known as their remuneration. In addition to base pay, it also includes any bonuses, commissions, overtime pay, or other financial perks that an employee receives from their firm. Direct cash payments or taxable fringe perks, like the use of a company car for personal use, are both acceptable forms of compensation. 94% websites provide information about remuneration policies and annual general meeting notices.
- vii. AGM Notice:** If at least 95% of the members eligible to vote in the meeting agree to the shorter notice, an AGM may be convened with less than 21 days' notice. The consent may be communicated verbally or electronically. A private business must have two members present in order to have a quorum for the annual general meeting. 94% websites disclose and present the data of selection procedure of AGM.
- viii. Result of AGM:** The main purpose of an annual general meeting, also known as an annual shareholder meeting, is to give shareholders the opportunity to vote on corporate matters and the appointment of the company's board of directors. It is the duty of the directors to keep the records of annual general meeting for interested parties in the business. 76.5% websites disclose the information about result of AGM.
- ix. AOA:** The "constitution of a firm" might be referred to as the articles of association (AoA). It specifies the guidelines that specify a company's internal operations. The organization's purpose and tactics for achieving its short-term and long-term objectives are stated in the articles of association. The AoA typically contains information on a company's legal name, address, purpose, equity capital, organisational structure, financial provisions and shareholder meeting provisions. The websites that offer MOA information is 32%.
- x. MOA:** The constitution of the firm is represented by a Memorandum of Association (MoA). It is a legal document created during a company's creation and registration process that outlines the company's relationship with shareholders and the goals for which it was established. Only the activities listed in the Memorandum of Association are permitted for the corporation to engage in. As a result, the MoA establishes the limit that the company's actions are not allowed to cross. The Memorandum of Association enables shareholders, creditors and anyone else interacting with the company to understand its fundamental rights and powers. Additionally, the information in the MoA aids potential shareholders in making the best choice when considering an investment in the business. 32 websites offer the Memorandum of Association information on their websites.

The overall CGI average score is 84%. Overall, many organizations follow strong corporate governance principles, but there is still room for development for enterprises to become more professional, transparent and able to win over stakeholders in order to thrive in today's fiercely competitive global market.

- **Marketing Information:** It is also one of the major criteria of web reporting and it is necessary for the firms to disclose information about their product line, services, track record, tender information etc.

Table 6: Item-wise Voluntary Disclosure of MI

Sr. No.	Items	Disclosure Score	%
1	Product & Services information	195	97.5
2	Advertisement of own products/services	189	94.5
3	Contact centers	200	100
4	Term & conditions for purchase	53	26.5
5	Sale & purchase notice	49	24.5
	Disclosure Score	686	
	Maximum Score	1000	
	Percentage	68.6	

- Product & Services information:** A product or service description is a form of marketing copy that describes a business's offerings to customers. For example, an online retailer will provide product descriptions on its website about the apparel items it sells. As far as marketing information is concerned, most businesses (97.50 %) use websites to inform clients and other parties about their products and services.
- Advertisement of own products:** Advertisement deals with the making the products and services aware among public by an enterprise to the public. It includes doing advertisement on TV, Newspaper etc. Company shares the information of budget spend on advertisement in annual report too. A website is utilized by 94.50 % of businesses as a promotional tool to advertise their other items.
- Contact center:** A contact centre system is a computer-based system with specialized answering "agent" stations, a sophisticated real-time contact management system and call and contact routing for high-volume telephone transactions. All businesses (100%) showcase their call centers.
- Terms and conditions:** Unless Buyer expressly agree in writing to the contrary, these Terms and Conditions shall represent the whole agreement between Buyer and Supplier with respect to the purchase by Buyer and sale by Supplier of goods. Only 26.50% of

corporations disclose terms and conditions for purchases,

- v. **Sale & purchase notice:** Sale and Purchase notice describes the time period when sale and purchases are made during the suitable time. 24.50 % of companies provide sale and purchase notice and a very few remaining companies submit tenders.

- **Corporate Social Responsibility (CSR)**

CSR is a business philosophy that urges businesses to assume social responsibility for their clients, employees, stakeholders, societies and the community in all facets of their operations. Corporate social responsibility is one of the important components of business organizations as it impacts their profitability and affecting their reputation. Voluntary disclosure of Corporate social Responsibility is as follows:

Table 7: Item-wise Voluntary Disclosure of CSR

S.No.	Corporate Social Responsibility and Human Resource Information	No. of Companies Disclosing an item	Disclosure Score (%)
1	Corporate Social Responsibility/Sustainability policy	178	89
2	Special CSR page	148	74
3	Environment, Health and Safety policy	128	64
4	Corporate Social Responsibility/Sustainability report	108	54
5	Awards and recognitions	88	44
	Disclosure Score	650	
	Maximum Score	1000	
	Percentage	65%	

- i. **Corporate Social Responsibility:** A management concept known as “corporate social responsibility” encourages businesses to incorporate social and environmental considerations into their daily operations and relationships with stakeholders. Generally speaking, CSR refers to a company’s efforts to balance its commitments to economic, environmental and social goals while also meeting stakeholder and shareholder expectations (sometimes known as the “Triple-Bottom-Line Approach”). It will directly improve a company’s reputation and brand, the concept of CSR unquestionably extends beyond those things. 89% websites depicted information regarding CSR policies on their websites.
- ii. **Special CSR Page:** Some company maintains a special CSR page which deals with the efforts made by companies for upgradation of environment and society as whole. 74% of the Corporations have a dedicated CSR page on their website

- iii. **Environment, Health and Safety policy:** EHS is an acronym for the group that researches and puts into practise the practical aspects of preserving the environment and ensuring health and safety at work. It stands for environment (E), health (H) and safety (S). From a safety perspective, it entails developing systematic measures and protocols for recognising workplace risks, minimising mishaps and protecting workers from harmful circumstances and substances. Additionally, it involves instructing staff members in emergency planning, accident response and the usage of safety gear and apparel. On their websites, 64% of the companies have also disclosed information about environment, health and safety measures adopted by companies.
- iv. **Corporate Social Responsibility/Sustainability Report:** Sustainability report includes all those activities which have been undertaken by organization for the betterment of the society. 54% companies publish report on corporate social responsibilities, business responsibility, donations or sponsorships made to nonprofit organizations and community groups.
- v. **Rewards and Recognition:** People are recognised for their engagement in the workplace through a system called reward and recognition, which can be extrinsic or intrinsic. When employees' achievements are fairly and promptly acknowledged and appreciated, there is an atmosphere of recognition and reward in the workplace. 44 % of corporations provided information about awards and recognitions.

- **Technological Aspects and User Support(TAUS)**

TAUS is ready to assess the technological soundness of websites. Table demonstrates that all companies have increased their ability to access products and services information with a single click by 65% and the investor relations page with a single click by 85% of all websites. 84 % of the businesses have frames around the webpage. The most recent announcements are posted on websites by 92.00% of businesses. Every single website offers annual reports in html, PDF or word format. All businesses (100%) offer downloadable PDF files. Non-financial papers can be downloaded from 99 % of websites. On their websites, 70% of businesses have privacy policies and 89.50% of businesses have copyright policies. Sitemaps are offered by 67 % of the websites, which is highly helpful for consumers to get a complete overview of the website. Only 59.50% of businesses enable screen reader access while 76% of businesses enable customer reviews online.

68.50% businesses include a link to parent company or a subsidiary on their website. 77.50% businesses utilise animated graphics to improve the aesthetics of websites. Only 5.5% of businesses offer a visitor counter and 50% disclose the date that their data was last updated. 7.5% of the websites have FAQ sections. 7.5 % of businesses display provider data. 69.50% of businesses have websites with blogs though cybersecurity is used by 68% of businesses for their websites. Only 8% of businesses offer glossaries, while 47% of businesses have

information about research and development on their websites. Only 5.5 % of businesses have an alexa link on their homepage. In contrast, 14.50 % have an instagram link, 16.50 % have a facebook link, 49.50 % have a linkedin link. However, chances of availability of pin interest and app download are very less.

Table 8: Item-wise Voluntary Disclosure of TAUS

Sr. No.	Items	Disclosure Score	%
1	One click to get to financial, investor relations, product & services information	200	100.00
2	Latest announcements/news	189	94.50
3	Privacy policy	140	70.00
4	Sitemap index of the company website contents	134	67.00
5	OnlineFeedback	152	76.00
6	FAQs	15	7.5
7	Research & Development	114	57.00
8	Company's facebook link on home page	33	16.50
9	Company's twitter link on homepage	33	16.50
10	Company's linkedin link onhome page	99	49.50
	Disclosure Score	1109	
	Maximum Score	2000	
	Percentage	55.45%	

- i. One click to get to financial, investor relations, product & services information: A link is provided by firms for updating the investors with financial information, how to develop investor relations, information about product & services. All the sampled firms presenting links on their websites for getting financial information and related to products,
- ii. Latest announcements/news: The day on which a firm makes major disclosures regarding a choice that will have a significant effect on business or the company's shareholders is known as the announcement date. 94.5% websites are disclosing the information about latest announcements.
- iii. Privacy Policy: An organization's privacy policy outlines how it will handle any customer, client, or employee data obtained during business operations. The majority of websites provide users with access to their privacy policies. 70% websites out of 200 presented their privacy policy ion their site.

- iv. Site map: Companies can describe the pages, video and other resources on site as well as the connections between them in a sitemap file. This file is examined by search engines like Google to improve the way company index website. 67% site map has been presented on the website.
- v. Online Feedback: A dynamic method for gathering customer feedback on websites and apps is an online feedback form. With the aim of obtaining particular feedback from your consumers and establishing whether or not they have accomplished their online objectives, such as placing an order for a product or contacting online assistance, feedback forms can be triggered in a variety of ways on companies' website. 76% websites are providing information related to feedback.
- vi. FAQs: A frequently asked questions (FAQ) list is widely used in publications, websites, email lists and online discussion forums where regular questions tend to come up, for instance through posts or inquiries by new members pertaining to typical knowledge gaps. So companies always try to settle the common queries of stakeholders through FAQs. Only a very few 7.5% websites showed the FAQs information.
- vii. R and D: Businesses engage in research and development (R&D) when they want to produce new products or find ways to enhance the ones they already have. Larger businesses might have their own in-house research and development group that will evaluate and improve items or procedures prior to use in the marketplace. So, companies usually give the information regarding the research and develop activities they take in their enterprises. 57% websites provided information regarding research and development related activities.
- viii. Company's facebook link on home page: Company's facebook link is also given on its website so that all the recent activities can be shared with the investors. 16.50% websites give information regarding facebook link to update stakeholders regarding link.
- ix. Company's twitter link on homepage: Company's twitter link is also given on its website so that all the recent activities can be shared with the investors. 16.50% websites give information regarding facebook link to update stakeholders regarding link.
- x. Company's linkedin link on home page: Company's linkedin link is also given on its website so that all the recent activities can be shared with the investors. 49.50% websites give information regarding linkedin link to update stakeholders regarding link.

• Information on Investor Relations (IRI)

Investors are a crucial part of every organization. To retain its market value, boost its net worth and improve its growth prospects, a company must consider the perception, preference and happiness of its investors. A corporation has a responsibility to the business's owners and ought to work to make the investors' lives easier by keeping amicable connections with them. Every organization typically has an investor relations officer assigned to address all investor-related issues. The web disclosure with regard to investor relation is as follows:

Table 10:Item-wiseVoluntary Disclosure of IRI

Sr. No.	Items	Disclosure Score	%
1	Link to investor relations on the homepage	186	96.50
2	E-mail address for investors relations	196	99.00
3	Phone number and postal address for investor relations	196	99.00
4	Shareholding pattern	200	100.00
5	AGM information	199	74.75
6	Financial Highlights/Ratio analysis	112	78.00
7	Downloading of reports in various version	196	99.00
	Disclosure Score	1285	
	Maximum Score	1400	
	Percentage	91.78%	

- i. **Link to investor relations on the homepage:** The function of the investor relations (IR) department of a firm, often a publicly traded one, is to accurately report on business matters to investors. Private and institutional investors can use this information to decide whether to invest in the company with confidence. Providing investors with a truthful picture of corporate operations is the responsibility of the investor relations (IR) department, a branch of a company. So a link is provided by the company to keep the investors update with regard to their investment. According to Table 96.50 % of businesses connect to their investor relations page from their main page.
- ii. **E-mail address for investors relations:** Incase any doubt by investors, an email address is given by the company on its site in order to tackle and settle the doubts of the investors. Company tries to resolve the query through email as soon as possible. 99% of companies additionally provide the email address.
- iii. **Phone number and postal address for investor relations:** Likewise email address,Phone number and postal address is also given on company website for direct contact by the investors. 99% of companies additionally provide the investor relations officers' phone number and their postal address.

- iv. **Shareholding Pattern:** The shareholding structure provides insight into how a company's shares are allocated among various entities. Shareholding patterns are important for trading since they provide traders with information about the financial health of a company. The division of shares that have not been listed on the stock exchange is referred to as the shareholding pattern. all of Companies (100%) post information on shareholding patterns
- v. **AGM Information:** The annual gathering of interested shareholders is known as an annual general meeting (AGM). Directors of the company report the financial performance of the company and shareholders vote on the pertinent topics at the annual general meeting (AGM). It is their duty to keep the all matters discussed in AGM in summarized form in their office for the all stakeholders. 74.75% of companies post information about AGMs on their websites.
- vi. **Financial highlights:** Financial highlights list an organization's most significant financial achievements. These highlights are often included in a distinct section of the financial report given to shareholders by a publicly traded corporation. 78% of businesses have ratio analysis and financial highlights on their websites.
- vii. **Downloading of reports in various version:** For the facility of investors, annual reports can be downloaded in various formats like pdf, xbrl, word etc. 99 % of websites allow users to download reports from previous years and in various formats.

Conclusion

A website is an accessible page that provides current information about a certain business. Users can access any information with a single mouse click using hypertext and hypermedia, which includes graphics, text, objects, multimedia and more. Every user has access to a website and anyone can utilize it to learn useful information. In India, the internet has expanded at a dizzying rate. Due to growing professionalism, global rivalry, the presence of Indian businesses abroad, the growth of the stock market, wide marketplaces and the presence of international clients, Indian businesses are fully utilizing information technology. Almost all Indian businesses have online presence. However, each website has a unique set of data that it makes available. Some companies include a ton of information, which they regularly update when new information becomes available while some businesses do not offer much information. Therefore, in the current study an attempt has been made to shed light on the nature and extent of non financial corporate web reporting by Indian Companies which is somewhat a neglected field. The purpose is to make the companies aware that ***both voluntary and non financial disclosures*** add towards enhancing the company's image for its investots.

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A STUDY ON THE SECTORAL CONTRIBUTION: IN THE DEVELOPMENT OF THE INDIAN ECONOMY.

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ABSTRACT:

The agriculture and industrial sectors are the major sectors to provide the major employment opportunities in India, but the statistics reveal the fact that the service sector is contributing more than 50 per cent of India's GDP. As India is the sixth largest economy by its nominal Gross Domestic Product and Third largest economy by its Purchasing Power Parity, after the adoption of a new economic policy of Liberalization, Privatization and Globalization in 1991 to overcome acute balance of payment crisis, achieved the annual average growth rate in GDP from 6 per cent to 7 per cent by the end of 20th century. There is major role of all individual sectors to achieve this growth rate and the new economic reforms not only led the growth in the major sectors but also a tremendous change in the different allied sectors like construction, textile, telecommunication and e-commerce etc. There a need to study about the role of individual sector contribution in the development the total GDP of India. The structure and their contribution were developed in the long-term development of the economy. This paper studies about sectoral contribution of all sectors in the development of the Indian Economy since 1991 to 2021. To examine the role of the individual sector for the development of the GDP of India, the relation between the variables to be studied by cointegration vector model. And the individual progress of the variables is studied by the descriptive statistics. This research paper also confines the impact of allied sectors growth in the development of the India's GDP.

Key words: Sectoral Contribution – New Economic Reforms – Impact Allied Sectors – Growth in GDP.

Introduction:

The GDP of India is a measurement of the development of the economy. The different sectors lie Agriculture and Allied, Industry and Service sectors have their contribution for the development of the India's GDP. At the time of Independence, the contribution of primary sector is more than 55 per cent in the GDP of India. But thereafter the contribution

of primary sector had been decreasing. The diversification of the economy from the primary sector to secondary sector, secondary sector to tertiary sector is showing a positive growth of the Indian Economy. Now the service sector is the biggest sector of India with the Gross Value Added at current price as 96 lakh crore in 2020-21 i.e., it accounts more than 55 per cent of the GVA. Continuously the industrial sector accounts for 25 per cent but the primary sector's share has been declined to 16.38 per cent of the GDP. The Primary Sector consists of agriculture, forestry and fishing while the secondary sector consists of industries like manufacturing, electricity, gas, water and other utility services. Tertiary sector consists of trade, hotels, transport, communication, financial services, real estate etc. The structure of the Indian Economy is going on to change after globalization since 1991. But the changing structure of the economy is favor to the industrial and service sectors only. In the industrial sector the consumer goods sector is showing at most growth and the service-oriented sector is growing up. The agriculture and allied sectors are not showing a long run share in the development of the economy. While India is the second larger producer of agriculture products. India accounts for 7.39 percent of total global agricultural output. But GDP of the Industry sector is \$560.97 billion, and world rank is 6. India's world rank is eight in the Services sector, and its GDP is \$1500 billion. The agriculture sector's contribution to the Indian economy is much higher than the world's average (6.4%). But development of the agriculture sector is poor. The impact of primary sector on the development of the economy will be revealed by the research results.

Review of Literature:

D. V. S. Sastry, Balwant Singh, Kaushik Bhattacharya and N. K. Unnikrishnan in their paper *Sectoral Linkages and Growth Prospects: Reflections on the Indian Economy* examined the linkage of growth among the agriculture, industry and services sectors of the economy, using both an input-output (I-O) and a simultaneous equation framework. Despite the substantial increase in the share of the services sector in GDP over the years, the I-O tables suggested that the agricultural sector still played an important role in determining the overall growth rate of the economy through demand linkages with other sectors of the economy. Narvikar Singh University of California in his paper *Services-Led Industrialization in India: Assessment and Lessons* provided an integrated analyzed the role of the service sector in recent Indian economic development. It discusses the nature of services, their distinction from products, and their categorization. It provides an overview of India's overall growth experience, and a detailed examination of the contribution of the service sector to growth. It includes an examination of the potential for spillovers from IT, ITES and other service sectors such as financial services, to the rest of the economy, drawing on econometric work, as well as input-output analysis of linkages to understand these possible spillovers and growth potentials. K.J Joseph in his paper *Chapter 7: Sectoral Innovation Systems in Developing*

Countries: The Case of ICT in India⁷ Sectoral innovation systems in developing countries: the case of ICT in India K.J. Joseph 7.1 Introduction The last two decades have witnessed a major shift in the development strategy among developing countries. The change implied a move away off. In the paper Constructing the Economy: The Role of Construction Sector in India's Growth Hrushikesh Mallick & Mantu Kumar Mahalik empirically examining the importance of construction sector in propelling economic growth rate in India, the study has found that in the presence of the dominant influence of capital stock, the impact of the construction sector gets blurred or neutralized. In the paper An empirical investigation on the inter-sectoral linkages in India Kaur, Gunjeet and Bordoloi, Sanjib and Rajesh, Raj examined in the research for a developing country like India where socio-economic problems such as poverty, unemployment and inequality influence policy decisions, it becomes important to study interlinkages among the constituent sectors so that positive growth impulses emerging among the sectors could be identified and fostered to sustain the growth momentum. An in-depth understanding of inter-sectoral dynamics becomes all the more important for policy makers so that effective monetary, credit and fiscal policies could be designed in order to be able to achieve the broader objective of inclusive development. In this backdrop, the present paper endeavors to study inter-sectoral linkages in the Indian economy both through input-output (I-O) approach and econometric exercises using co-integration and state-space models. Cointegration analysis is carried out both at sectoral and sub-sectoral levels since mid-1980s. At the broad sectoral level, primary, secondary and tertiary (excluding community, social and personal services) sectors display strong long-run equilibrium relationship amongst each other. These sectors also displayed strong long-run equilibrium relationship with one another in a bivariate framework. At the sub-sectoral level, existence of long-term equilibrium was found between 'trade, hotels, transport & communication' and 'manufacturing' sectors. Further, the financial sector activity in the 'banking & insurance' sector was found to be co-integrated with the 'manufacturing' and 'primary' sectors. The sectors, which displayed long-run equilibrium relationships, were re-estimated through state space model using Kalman filter. This also corroborated that variation in one sector influenced the other sector's performance over time. In view of the prevailing sectoral inter-relationships, the paper explores policy options so that positive growth impulses developing among the sectors are fostered.

Research Methodology:

In this research paper the time series annual data is collected from 1991 to 2021 on five economic indicators as GNI in the current price in US dollar, Agriculture Forestry & Fishing, Mining and Quarrying as primary sector in value added % of GNI at real prices, Manufacturing, Construction, Electricity, Gas and water supply in secondary sector in value added % of GNI at real prices, Financing, Insurance & Real Estate Community Society

& Individual Services in tertiary sector in value added % of GNI at real prices. This research paper studies the causal relationship between economic development and sectoral contribution and vice versa.

Model for Estimation:

$$GNI = C(1) + C(2)*AFM + C(3)*CSPS + C(4)*FIR + C(5)*MCE$$

AFM = Agriculture Forestry & Fishing, Mining and Quarrying

MCE = Manufacturing, Construction, Electricity, Gas and water supply

FIR = Financing, Insurance & Real Estate

CSPS = Community Society & Individual Services

The above study uses Johansen's method to estimate the cointegration between the sectoral contribution between the GNI and its contributing sectors. To know the causality between the variables the Engle-Granger causality technique is used through Vector Autoregressive framework is used. To adopt the cointegration model the stationarity in the variables is required to know the stationarity among the variables the graphic method, the correlogram method and unit root test under Augmented Dicky Fuller test is used. After getting the stationarity information the Cointegration test and the Least squares estimation are used to know the real contribution of the sectors in the GNI which indicates the Economic Development of India.

Hypothesis

H_0 : There is no cointegration between the variables.

H_1 : H_0 is rejected.

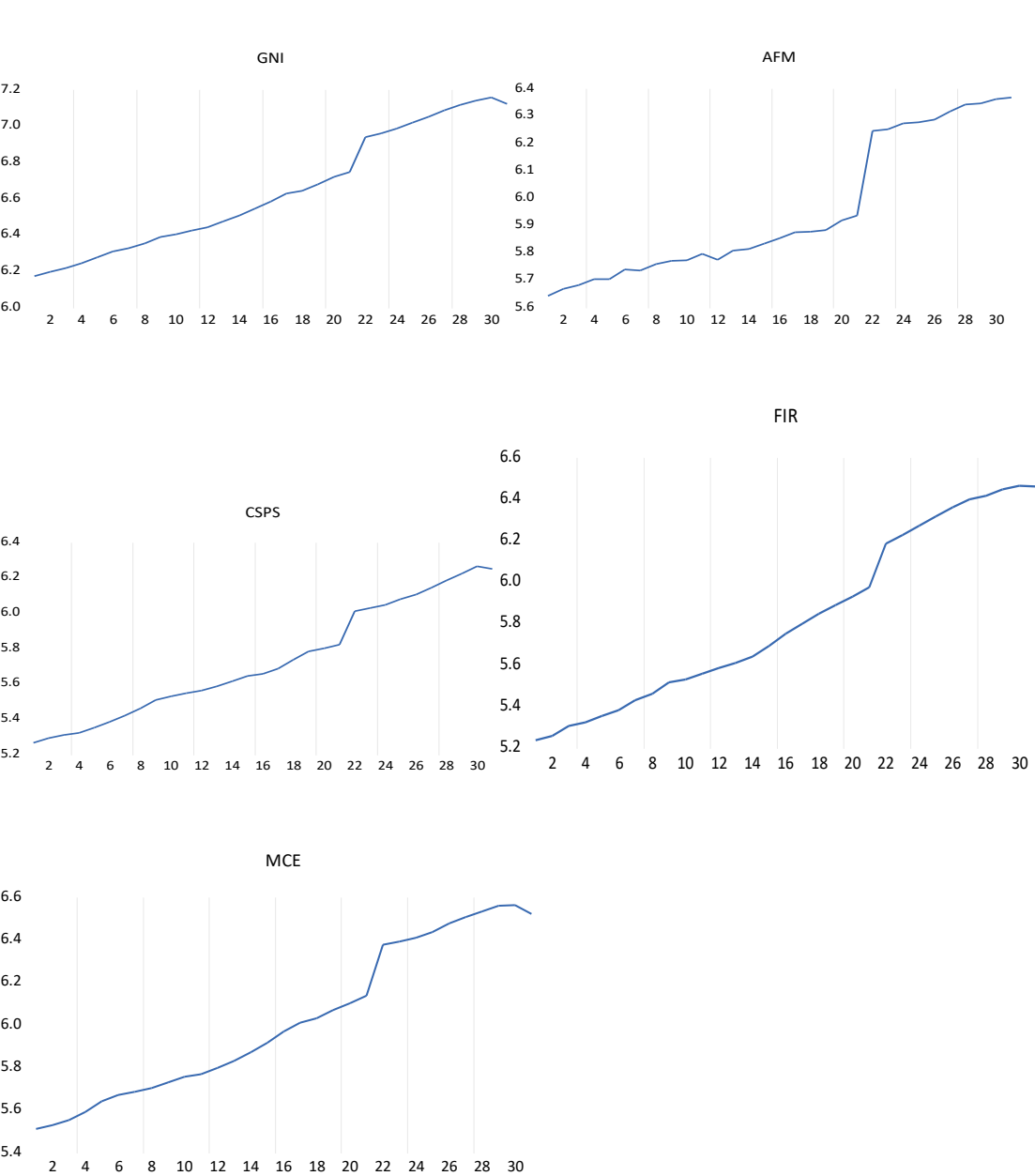
Explanation of the Study:

1. Test for Stationarity of the Variables:

To test the stationarity of the above said variable, the different tests are measured. Among such methods, the below figure i.e., figure – 1 indicates the graphic method to understand the stationarity of the variables. The figure shows that the study variables are non - stationary in their time series trends.

a) Graphic Method:

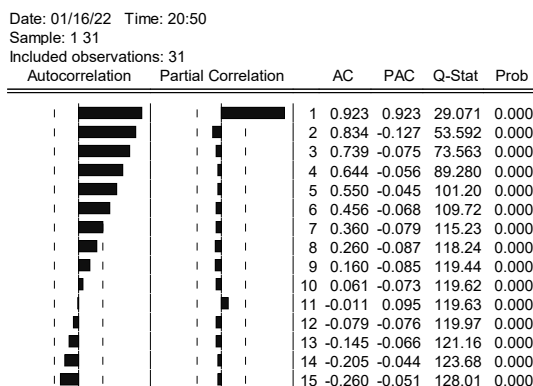
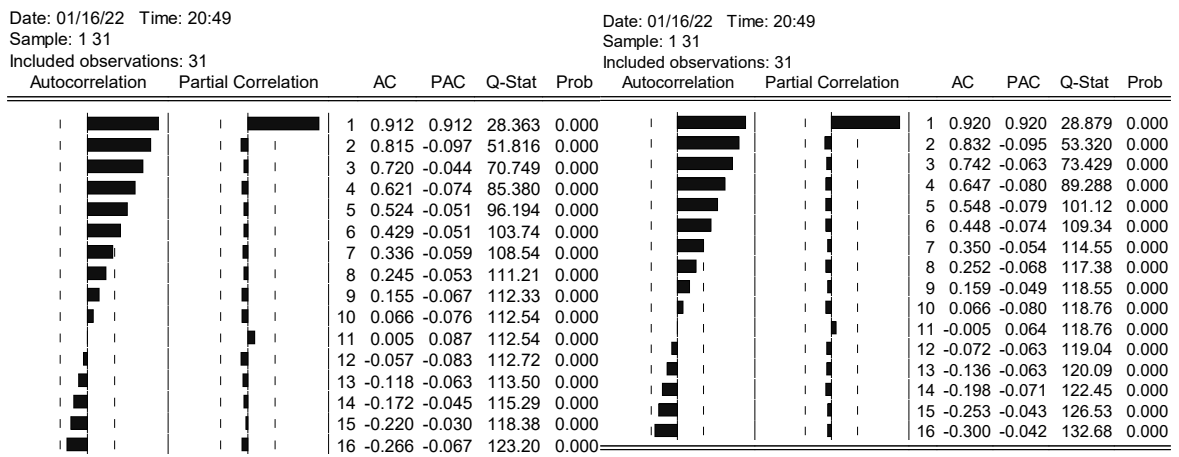
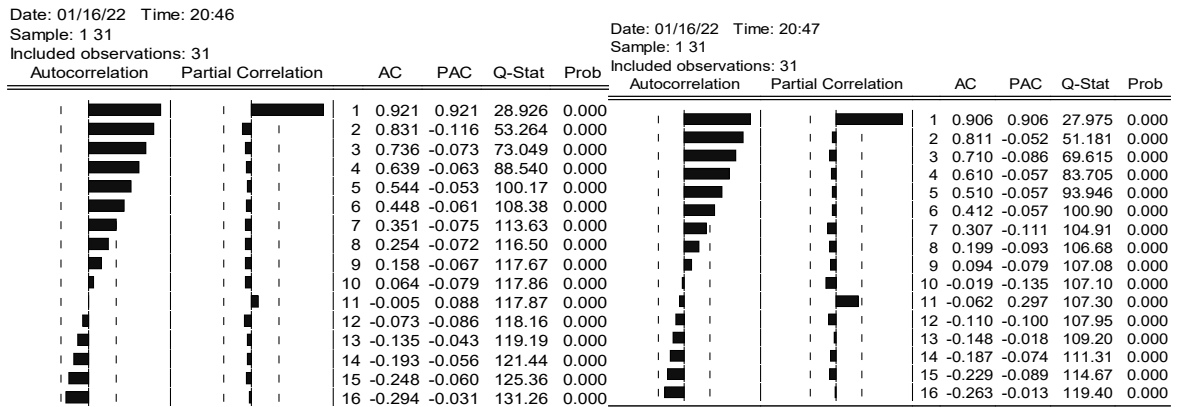
Figure - 1



b) Correlogram

To examine stationarity of the variables the correlogram graph is measured. The below figure shows the information as the measuring variables are non-stationary because the values lay above the $\frac{1}{4}$ of the lag of the series. Then we conclude the variables are non – stationary.

Figure - 2



It is also concluded with the results below as the polynomial characterizes of roots indicate as no root lies outside the unit circle. VAR satisfies the stability condition.

Figure - 3

Roots of Characteristic Polynomial
Endogenous variables: GNI AFM CSPA FIR
MCE
Exogenous variables: C
Lag specification: 1 1
Date: 01/16/22 Time: 01:15

Root	Modulus
0.960893 - 0.078897i	0.964127
0.960893 + 0.078897i	0.964127
0.847206	0.847206
0.280627	0.280627
0.130759	0.130759

No root lies outside the unit circle.
VAR satisfies the stability condition.

Figure - 4

VAR Residual Serial Correlation LM Tests

Date: 01/16/22 Time: 01:21

Sample: 1 31

Included observations: 30

Null hypothesis: No serial correlation at lag h

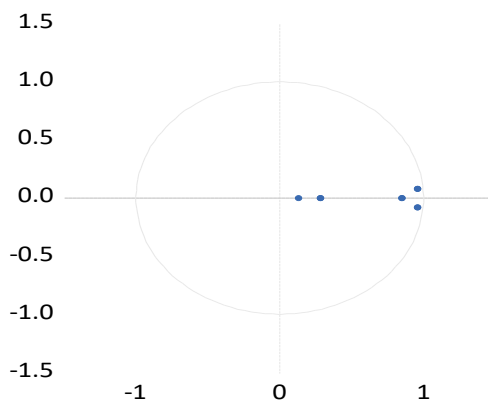
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	30.33833	25	0.2119	1.270288	(25, 57.2)	0.2249

Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	30.33833	25	0.2119	1.270288	(25, 57.2)	0.2249

*Edgeworth expansion corrected likelihood ratio statistic.

Inverse Roots of AR Characteristic Polynomial



c) Unit Root Test:

When the graphic method and the correlogram indicated as the study variables are non – stationary, to test the stationarity of the variables the third method in cointegration, the Unit Root Test is used. To test the Augmented Dicky Fuller Test the lag length criteria is decided on the information lag intervals of the below mentioned results of the lag estimation. According to the ADF test the first difference of the variable have shown the stationarity of the variables. Which the information is based on the lag length of the difference between the

critical values to the maximum Eigen value linear intercept with no trend is selected. The information is revealed by the figure – 5.

Lag Length Criteria

Figure - 5

Date: 01/15/22 Time: 21:43
Sample: 1 31
Included observations: 29
Series: GNI AFM CSPA FIR MCE
Lags interval: 1 to 1

Selected (0.05 level*) Number of Cointegrating Relations by Model

Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	1	2	2	1	1
Max-Eig	0	0	0	1	1

*Critical values based on MacKinnon-Haug-Michelis (1999)

Information Criteria by Rank and Model

Data Trend:	None	None	Linear	Linear	Quadratic
Rank or	No Intercept	Intercept	Intercept	Intercept	Intercept
No. of CES	No Trend	No Trend	No Trend	Trend	Trend

Log Likelihood by Rank (rows) and Model (columns)

0	409.9951	409.9951	414.4358	414.4358	417.5341
1	423.9719	424.8604	428.5047	434.5940	437.2833
2	434.2013	437.3124	439.5585	446.7513	449.4381
3	438.7136	445.2570	445.5680	455.8257	458.3900
4	441.4178	449.7563	449.7936	460.6658	462.8364
5	442.0009	452.4354	452.4354	464.8693	464.8693

Akaike Information Criteria by Rank (rows) and Model (columns)

0	-26.55139	-26.55139	-26.51282	-26.51282	-26.38166
1	-26.82565	-26.80417	-26.79343	-27.14441	-27.05402
2	-26.84147	-26.91810	-26.86611	-27.22423*	-27.20263
3	-26.46301	-26.70738	-26.59089	-27.09143	-27.13034
4	-25.95985	-26.25905	-26.19266	-26.66660	-26.74734
5	-25.31041	-25.68520	-25.68520	-26.19788	-26.19788

Schwarz Criteria by Rank (rows) and Model (columns)

0	-25.37268*	-25.37268*	-25.09837	-25.09837	-24.73148
1	-25.17547	-25.10683	-24.90750	-25.21134	-24.93235
2	-24.71980	-24.70213	-24.50870	-24.77253	-24.60948
3	-23.86986	-23.97279	-23.76201	-24.12109	-24.06571
4	-22.89522	-23.00583	-22.89229	-23.17764	-23.21123
5	-21.77430	-21.91335	-21.91335	-22.19029	-22.19029

Augmented Dicky – Fuller Test Statistic

The collected data of the variable are converted into natural logarithmic form and tested with level form and the first difference under ADF test the level results showed that the variables are non – stationary but the first differences of the variables are shown the stationarity of the variables. Then the residuals are also tested for the stationarity. The information is revealed by the Table – 1 and figure – 6 below.

Table: 1

Variables	P – value of level 5%	P – value at I(I)	Justification
GNI	<u>0.9344</u>	<u>0.0004</u>	Stationary
AFM	<u>0.9403</u>	<u>0.0001</u>	Stationary
CSPA	<u>0.9709</u>	<u>0.0001</u>	Stationary
FIR	<u>0.9636</u>	<u>0.0010</u>	Stationary
MCE	<u>0.9020</u>	<u>0.0005</u>	Stationary

Residual stationary**Figure - 6**

Null Hypothesis: RESID06 has a unit root
 Exogenous: None
 Lag Length: 0 (Automatic - based on AIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.650263	0.0000
Test critical values: 1% level	-2.644302	
5% level	-1.952473	
10% level	-1.610211	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(RESID06)
 Method: Least Squares
 Date: 01/15/22 Time: 22:04
 Sample (adjusted): 2 31
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID06(-1)	-0.865774	0.186177	-4.650263	0.0001
R-squared	0.427026	Mean dependent var	-9.13E-05	
Adjusted R-squared	0.427026	S.D. dependent var	0.006066	
S.E. of regression	0.004592	Akaike info criterion	-7.896297	
Sum squared resid	0.000611	Schwarz criterion	-7.849590	
Log likelihood	119.4444	Hannan-Quinn criter.	-7.881355	
Durbin-Watson stat	1.889794			

1) Decision Criteria:**a) Johannes Cointegration Test:**

The Decision Criteria on the results of the Johannes Cointegration Test, the trace value is greater than the critical value, then the null hypothesis is rejected and it reveals the information as there is a long term cointegration between the variables. The information is produced below Figure number 7 & 8.

Figure - 7

Sample (adjusted): 4 31
 Included observations: 28 after adjustments
 Trend assumption: Linear deterministic trend
 Series: GNI AFM CSPA FIR MCE
 Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.772086	88.20926	69.81889	0.0009
At most 1	0.510906	46.80329	47.85613	0.0626
At most 2	0.437218	26.77766	29.79707	0.1072
At most 3	0.226672	10.68148	15.49471	0.2318
At most 4	0.116999	3.484010	3.841465	0.0620

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Figure - 8**Unrestricted Cointegration Rank Test (Maximum Eigenvalue)**

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.772086	41.40597	33.87687	0.0053
At most 1	0.510906	20.02563	27.58434	0.3394
At most 2	0.437218	16.09618	21.13162	0.2193
At most 3	0.226672	7.197473	14.26460	0.4660
At most 4	0.116999	3.484010	3.841465	0.0620

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Vector Autoregressive Estimates

After the test of the stationarity under ADF Vector Autoregressive Estimates (VAR) results are examined. According to the results below the vector autoregressive estimates reveal the information that the autoregressive values of the variables mutually. The t – statistic values can indicate the amount of regression of the variables. The VAR estimates are given in the figure – 7.

Figure - 7**Vector Autoregression Estimates**

Date: 01/16/22 Time: 21:33

Sample (adjusted): 2 31

Included observations: 30 after adjustments

Standard errors in () & t-statistics in []

	GNI	AFM	CSPS	FIR	MCE
GNI(-1)	0.382852 (1.18494) [0.32310]	-0.352255 (2.16760) [-0.16251]	0.594800 (1.20963) [0.49172]	0.317883 (1.29276) [0.24590]	0.118237 (1.52617) [0.07747]
AFM(-1)	-0.283143 (0.11055) [-2.56126]	0.578835 (0.20223) [2.86233]	-0.253208 (0.11285) [-2.24373]	-0.333466 (0.12061) [-2.76489]	-0.367393 (0.14238) [-2.58031]
CSPS(-1)	-0.479606 (0.39716) [-1.20760]	-0.607962 (0.72652) [-0.83682]	0.215517 (0.40543) [0.53157]	-0.590555 (0.43330) [-1.36294]	-0.813999 (0.51153) [-1.59131]
FIR(-1)	0.799095 (0.46077) [1.73427]	1.051616 (0.84288) [1.24765]	0.506789 (0.47037) [1.07743]	1.256577 (0.50269) [2.49969]	0.960324 (0.59345) [1.61819]
MCE(-1)	0.256539 (0.63464) [0.40423]	-0.055670 (1.16094) [-0.04795]	-0.255042 (0.64786) [-0.39367]	0.167453 (0.69239) [0.24185]	0.746596 (0.81740) [0.91338]
C	2.363238 (1.58372) [1.49221]	2.563005 (2.89710) [0.88468]	0.668260 (1.61672) [0.41334]	0.795455 (1.72783) [0.46038]	2.030575 (2.03979) [0.99548]
R-squared	0.993343	0.964174	0.992716	0.995094	0.990749
Adj. R-squared	0.991956	0.956710	0.991199	0.994071	0.988822
Sum sq. resids	0.020155	0.067444	0.021003	0.023989	0.033434
S.E. equation	0.028979	0.053011	0.029583	0.031616	0.037324
F-statistic	716.2291	129.1793	654.1944	973.5061	514.0740
Log likelihood	67.01462	48.89668	66.39593	64.40198	59.42254
Akaike AIC	-4.067641	-2.859779	-4.026395	-3.893465	-3.561502
Schwarz SC	-3.787402	-2.579539	-3.746156	-3.613226	-3.281263
Mean dependent	6.655899	5.965575	5.745662	5.845599	6.037621
S.D. dependent	0.323105	0.254783	0.315330	0.410608	0.353025
Determinant resid covariance (dof adj.)		3.25E-19			
Determinant resid covariance		1.07E-19			
Log likelihood		442.4422			
Akaike information criterion		-27.49615			
Schwarz criterion		-26.09495			
Number of coefficients		30			

b) Granger – Causality Test:

To estimate the Granger Causality test, the study variables should not be serial correlated. In the figure – 7, lag 4 length indicate that there is no serial correlation between the variables. The autocorrelation structure among the variables is also displayed by the figure – 8. And the figure – 9 indicates the causality of the variables mutually reveal information as the independent variables cointegrate with the dependent variable. Hence, the null hypothesis is rejected.

Figure - 7

VAR Residual Serial Correlation LM Tests

Date: 01/17/22 Time: 08:45

Sample: 1 31

Included observations: 30

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	30.33833	25	0.2119	1.270288	(25, 57.2)	0.2249
2	20.42977	25	0.7239	0.792398	(25, 57.2)	0.7345
3	18.75425	25	0.8087	0.718181	(25, 57.2)	0.8168
4	33.38291	25	0.1218	1.431513	(25, 57.2)	0.1317

Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	30.33833	25	0.2119	1.270288	(25, 57.2)	0.2249
2	51.34465	50	0.4208	1.000064	(50, 49.0)	0.5003
3	65.70896	75	0.7695	0.661873	(75, 28.2)	0.9191
4	381.8742	100	0.0000	57.39139	(100, 4.7)	0.0002

*Edgeworth expansion corrected likelihood ratio statistic.

Figure –8

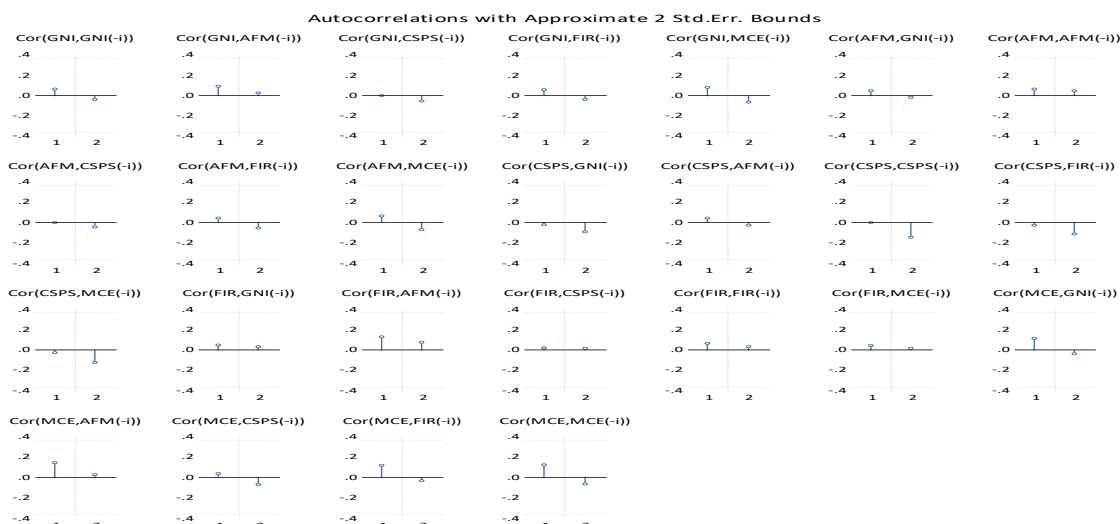


Figure –9**Pairwise Granger Causality Tests**

Date: 01/17/22 Time: 08:47

Sample: 1 31

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
AFM does not Granger Cause GNI	30	5.94556	0.0216
GNI does not Granger Cause AFM		5.09242	0.0323
CSPS does not Granger Cause GNI	30	1.43157	0.2419
GNI does not Granger Cause CSPS		2.61528	0.1175
FIR does not Granger Cause GNI	30	4.08582	0.0533
GNI does not Granger Cause FIR		0.83268	0.3696
MCE does not Granger Cause GNI	30	0.72120	0.4032
GNI does not Granger Cause MCE		0.11249	0.7399
CSPS does not Granger Cause AFM	30	3.44306	0.0745
AFM does not Granger Cause CSPS		1.87932	0.1817
FIR does not Granger Cause AFM	30	5.95166	0.0216
AFM does not Granger Cause FIR		6.54100	0.0165
MCE does not Granger Cause AFM	30	5.46701	0.0270
AFM does not Granger Cause MCE		7.06392	0.0131
FIR does not Granger Cause CSPS	30	4.75461	0.0381
CSPS does not Granger Cause FIR		2.66819	0.1140
MCE does not Granger Cause CSPS	30	1.85404	0.1846
CSPS does not Granger Cause MCE		0.81048	0.3759
MCE does not Granger Cause FIR	30	0.00035	0.9853
FIR does not Granger Cause MCE		0.94879	0.3387

1. Linear Deterministic Trend:

The linear relation between the variables GNI and its independent variables AFM, CSPS, FIR, MCE is determined with the estimation method of least squares. The results indicate the information as the except the AFM the other sectors have been shown a greater impact on the GNI for its development. The coefficient of variation is 0.01 in AFM which is very least in the comparison of other study variables. The figure – 10 below reveals the information. Figure – 11 indicate that the regression relation between the independent variables and dependent variables followed by figure – 12 & 13.

Model Estimation:

$$GNI = C(1) + C(2)*AFM + C(3)*CSPS + C(4)*FIR + C(5)*MCE$$

$$GNI = 1.25341532504 + 0.0107998985421*AFM + 0.236182244514*CSPS + 0.195566258752*FIR + 0.470018001406*MCE$$

Figure –10

Dependent Variable: GNI
Method: Least Squares
Date: 01/15/22 Time: 21:59
Sample: 1 31
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.253415	0.090697	13.81983	0.0000
AFM	0.010800	0.017760	0.608114	0.5484
CSPS	0.236182	0.044859	5.265037	0.0000
FIR	0.195566	0.062750	3.116582	0.0044
MCE	0.470018	0.053521	8.781919	0.0000
R-squared	0.999808	Mean dependent var	6.640287	
Adjusted R-squared	0.999779	S.D. dependent var	0.329352	
S.E. of regression	0.004899	Akaike info criterion	-7.653067	
Sum squared resid	0.000624	Schwarz criterion	-7.421779	
Log likelihood	123.6225	Hannan-Quinn criter.	-7.577673	
F-statistic	33897.27	Durbin-Watson stat	1.710941	
Prob(F-statistic)	0.000000			

Figure - 11

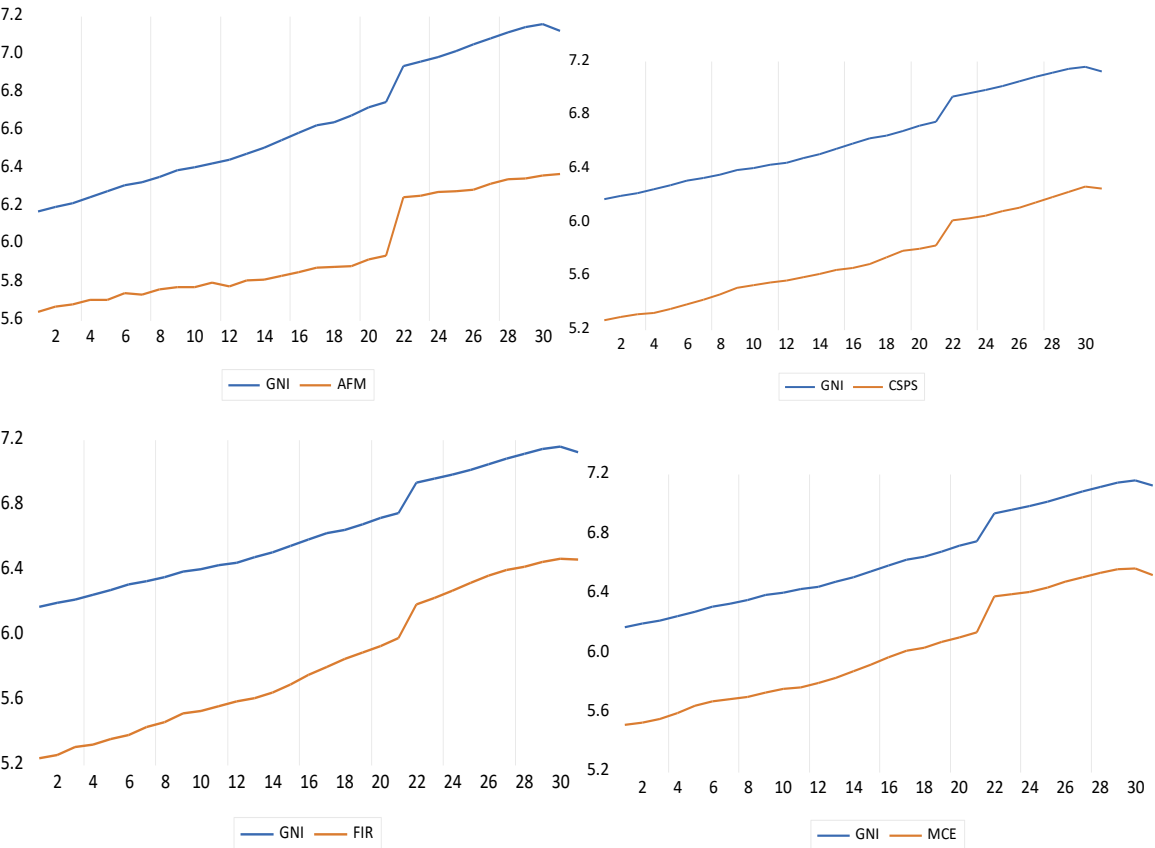


Figure - 12Unrestricted Cointegrating Coefficients (normalized by $b^*S11^*b=l$):

GNI	AFM	CSPS	FIR	MCE
-161.5053	-3.519142	68.97748	-90.36896	194.7070
86.86988	-27.18500	-31.41926	-28.05406	-1.793871
336.2609	4.776615	-44.66386	-100.0762	-156.0168
196.4098	-3.235017	-104.9090	-19.08283	-62.65317
160.7883	-11.14539	-33.82573	-29.26512	-71.78455

Unrestricted Adjustment Coefficients (alpha):

D(GNI)	-0.001632	0.014314	-0.012292	-0.000412	0.001819
D(AFM)	-0.003630	0.023108	-0.015158	-0.001338	0.008949
D(CSPS)	-0.000813	0.014316	-0.009948	0.003732	0.002427
D(FIR)	0.002920	0.018042	-0.009048	-0.001071	0.002329
D(MCE)	-0.006095	0.019173	-0.013588	-0.002152	0.001920

Figure –13

1 Cointegrating Equation(s): Log likelihood 442.3132

Normalized cointegrating coefficients (standard error in parentheses)

GNI	AFM	CSPS	FIR	MCE
1.000000	0.021790	-0.427091	0.559542	-1.205576
	(0.02490)	(0.06292)	(0.10619)	(0.10697)

Adjustment coefficients (standard error in parentheses)

D(GNI)	0.263552
	(1.12508)
D(AFM)	0.586210
	(1.92246)
D(CSPS)	0.131312
	(1.09795)
D(FIR)	-0.471593
	(1.19660)
D(MCE)	0.984434
	(1.40141)

Conclusion:

The contributing sectors of the Gross National Income have long term impact the development for the Indian Economy. India has a land mark in many dimensions of its progress in different sectors since independence. Thereafter the New Economic Policy implementation since 1991 India got the boost up for the development in all the dimensions. Agriculture and allied sectors like forestry, logging and fishing accounted more in GDP, employed 60% of the total workforce and despite a steady decline of its share in the GDP, is still the largest economic sector and plays a significant role in the overall socio-economic development of India. The agriculture and allied sector are the major sector in the Indian Economy. It contributes its in the provision of livelihood to the majority of people and employment oppor-

tunity but like the remaining sectors the primary sector is not showing much cointegration with the GNI. The secondary and tertiary sectors have a positive cointegration with the GNI of India in the long run but not the primary sector. And also, the regression between the primary sector and the Gross National Income is very low. According to this analysis, it is concluded that the structural change of the Indian economy has no positive impact on the primary sector. Much contribution is needed to get empirical change in the agriculture and allied sectors. But the improvements in irrigation, technology, application of modern agricultural practices, provision of agricultural credit and subsidies are more needed for the development of the sector.

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MERGER AND ACQUISITION OF SBI & ASSOCIATE BANKS: “A STUDY OF PRE AND POST MERGER”

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ABSTRACT

The consolidation of the State Bank of India (SBI) with its associate banks in 2017 represents one of the largest mergers in Indian banking history. This article examines the pre- and post-merger performance of SBI using primary and secondary data. Primary data were collected from 120 customers and 40 bank employees through structured questionnaires, while secondary data were sourced from annual reports, RBI publications, and financial databases. The study evaluates financial performance, operational efficiency, customer satisfaction, employee concerns, and technological integration. The findings reveal that although the merger caused short-term challenges—such as an increase in NPAs and customer service disruptions—significant long-term gains were observed in profitability, digital operations, and branch rationalization. The study concludes that the merger strengthened SBI’s national and global position and provides insights for future consolidation strategies in Indian public-sector banks.

Keywords: *Merger, Acquisition, SBI, Financial Performance, Customer Satisfaction, Operational Efficiency.*

1. INTRODUCTION:

Mergers and acquisitions (M&A s) are strategic tools that improve competitiveness, reduce operational redundancy, and enhance financial stability. In India, the merger of the State Bank of India with its associate banks—State Bank of Bikaner & Jaipur, State Bank of Travancore, State Bank of Patiala, State Bank of Mysore, and State Bank of Hyderabad—created the largest public-sector bank in the country (RBI, 2018). This study examines the impact of the merger by comparing pre-merger and post-merger performance indicators and analysing stakeholder perceptions.

2. REVIEW OF LITERATURE:

Past research indicates that banking mergers enhance cost efficiency and expand market power (Gupta & Kaur, 2017). Lamba (2019) found that SBI's associates displayed inconsistent asset quality before the merger, requiring consolidation. Patel and Shah (2021) discovered that SBI experienced short-term profitability decline post-merger due to inherited NPAs.

Studies such as Mehra (2020) highlighted employee concerns including workload stress and job uncertainty. Meanwhile, Rathore (2021) documented that customer satisfaction improved after technological integration and branch restructuring.

Overall, the literature suggests that M&A benefits materialize over the long term, particularly in terms of operational efficiency and digital transformation.

3. OBJECTIVES OF THE STUDY:

1. To analyse the financial performance of SBI before and after the merger.
2. To examine customer satisfaction levels regarding post-merger banking services.
3. To study employee perceptions of operational and technological changes.
4. To evaluate the overall effectiveness of the merger in strengthening SBI's position.

4. RESEARCH METHODOLOGY:

4.1 RESEARCH DESIGN:

A descriptive and analytical research design was adopted.

4.2 DATA SOURCES:

Primary Data:

- **Customers surveyed:** 120.
- **Employees surveyed:** 40.
- **Tools:** Structured questionnaire (Likert scale 1–5), personal interviews.

Secondary Data:

- SBI annual reports (2014–2023).
- RBI databases.
- Financial statements of associate banks.
- Published research articles and government publications.

4.3 SAMPLING TECHNIQUE:

Convenience sampling for customers.

Purposive sampling for employees.

4.4 TOOLS FOR ANALYSIS:

- Mean percentage analysis.
- Paired t-test (pre vs. post financial ratios).
- Descriptive statistics
- Graphical representation

5. DATA ANALYSIS AND INTERPRETATION:

5.1 Financial Performance Analysis (Secondary Data):

Table 1: Key Financial Ratios (Pre- and Post-Merger):

Indicator	Pre-Merger Avg. (2014–2017)	Post-Merger Avg. (2018–2023)
Net Profit (₹ Crores)	12,500	22,300
Gross NPA (%)	7.2	5.1
Net NPA (%)	4.4	1.8
ROA (%)	0.45	0.62
ROE (%)	7.8	11.4

Interpretation: Profitability significantly improved post-merger due to asset restructuring and strong credit growth.

5.2 Financial Trend Analysis:

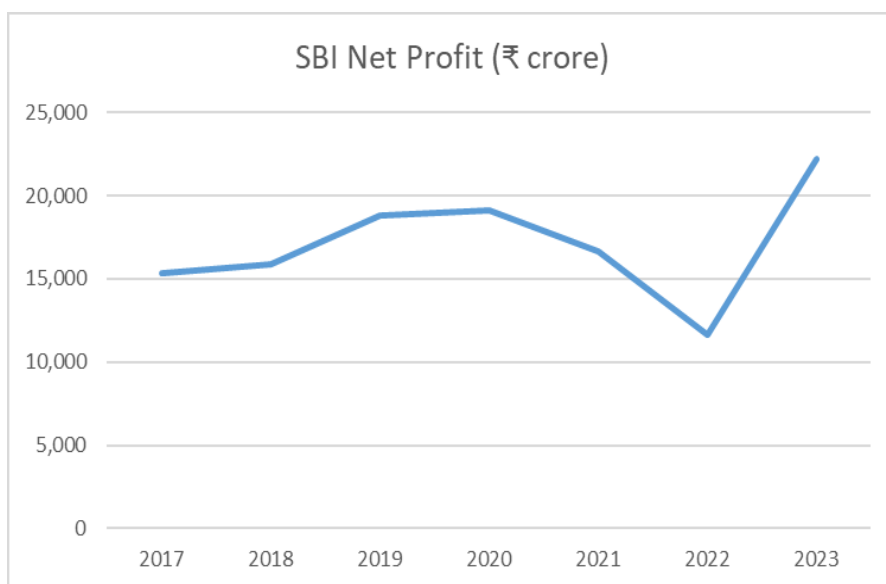
Post-Merger Trend of Net Profit (2017–2023)

Here are **SBI's net profit (PAT)** figures for FY 2017–2023, based on publicly available data:

Table:

Financial Year (March)	SBI Net Profit (₹ crore)
2017	15,297
2018	15,888
2019	18,769
2020	19,094
2021	16,648
2022	11,598
2023	22,203

Chart:



Notes / observations:

- These are **consolidated net profits** (as per Screener.in data).
- There is a **dip in 2022**, followed by a strong recovery in **2023**.
- For accuracy, especially for academic or report-writing purposes, you may cross-verify these numbers with SBI's annual reports or official financial disclosures.

5.3 Primary Data Analysis – Customer Survey:

Table 2: Customer Satisfaction (Post-Merger)

(Scale: 1 = Very Low; 5 = Very High)

Service Area	Mean Score
Digital Banking Services	4.2
ATM & Branch Accessibility	3.8
Complaint Resolution	3.5
Employee Courtesy	4.0
Transaction Speed	4.1

Interpretation: Customers appreciate digital improvements but expect faster issue resolution.

5.4 Employee Perception (Primary Data):

Employee Opinions on Post-Merger Work Environment

- 65% reported improved technology
- 22% reported increased workload
- 13% felt job insecurity

Interpretation: Technological advancement is accepted, but workload pressures remain.

6. FINDINGS:

1. SBI’s profitability improved significantly after 2020 due to better asset quality.
2. Gross NPAs declined by over 2% after the merger as SBI implemented strict recovery mechanisms.
3. Customer satisfaction with digital banking (UPI, YONO, online services) improved considerably.
4. Employees faced initial stress due to system migration and branch restructuring.
5. Operational efficiency increased due to elimination of overlapping branches and centralized operations.

7. DISCUSSION:

The merger proved transformative for SBI, allowing it to become a global-scale bank comparable to international competitors. The integration of advanced digital technologies (e.g., YONO), rationalization of branches, and unified HR policies benefited the bank in the long run. However, initial problems such as service delays and staff stress highlight the need for better transition planning in large-scale mergers.

8. CONCLUSION:

The merger of SBI and its associate banks has been largely successful. Although the bank faced challenges in the early phases—particularly concerning NPAs, customer migration issues, and employee adjustments—the long-term impact has been positive. Financial performance strengthened, operational efficiency improved, and customer experience enhanced with digital transformation. The findings suggest that similar mergers in Indian public-sector banks can produce substantial benefits if managed strategically.

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A STATISTICAL ANALYSIS OF ACADEMIC PERFORMANCE, DIGITAL LITERACY, AND SOCIO-ECONOMIC FACTORS AMONG COLLEGE STUDENTS IN CHENGALPATTU, TAMIL NADU

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ABSTRACT

This study employs a comprehensive statistical data analysis framework to investigate the key factors influencing the academic performance of college students in the Chengalpattu district of Tamil Nadu. In an increasingly competitive and digitalized academic environment, understanding these determinants is crucial for fostering student success. A structured questionnaire was used to collect data from a stratified random sample of 350 undergraduate students across various disciplines. The data encompassed variables including academic scores (CGPA), daily study hours, digital literacy proficiency, parental education and income, and access to educational resources.

The analysis was conducted in a multi-stage process. Initially, Descriptive Statistics (mean, standard deviation, frequency distributions) were used to summarize the demographic and academic characteristics of the sample, revealing a diverse participant profile. Subsequently, Correlation Analysis (Pearson's r) was applied to identify significant bivariate relationships. The results indicated strong positive correlations between academic performance and both digital literacy skills ($r = 0.68$, $p < 0.01$) and parental education level ($r = 0.52$, $p < 0.01$).

To determine the predictive power of these variables, a Multiple Linear Regression Analysis was performed with academic performance as the dependent variable. The regression model was statistically significant ($F = 24.75$, $p < 0.001$) and explained 58% of the variance in academic scores ($R^2 = 0.58$). Digital literacy ($\beta = 0.38$, $p < 0.001$) emerged as the strongest positive predictor, followed by daily study hours ($\beta = 0.28$, $p < 0.01$). Interestingly, while family income showed a weak positive correlation, it was not a significant predictor in the presence of other variables in the regression model. The findings underscore the critical importance of enhancing digital competencies and effective study habits. This research provides evidence-based insights for educational institutions in the region to develop targeted intervention programs aimed at improving student outcomes.

Keywords: *Statistical Data Analysis, Descriptive Statistics, Regression Analysis, Correlation, Academic Performance, College Students, Chengalpattu, Socio-economic Factors, Digital Literacy.*

1. Introduction

The pursuit of academic excellence in higher education is a multifaceted endeavor, influenced by a complex interplay of personal, social, economic, and technological factors. In the context of a rapidly evolving global educational landscape, where digital tools have become integral to learning and assessment, understanding the determinants of student success is more critical than ever. For developing regions like Tamil Nadu, which boasts a high density of educational institutions, identifying and nurturing these determinants can have profound implications for regional development and social mobility.

Chengalpattu district, a rapidly urbanizing region in the shadow of Chennai, presents a unique microcosm of modern Indian higher education. Its colleges cater to a diverse student body, ranging from those in semi-urban and rural backgrounds to students from highly connected urban families. This diversity makes it an ideal setting to investigate how traditional socio-economic factors and contemporary digital competencies converge to shape academic outcomes.

Academic performance, often measured by Cumulative Grade Point Average (CGPA), has long been linked to socio-economic status (SES) indicators such as parental education, family income, and access to resources (Sirin, 2005). Higher SES is generally associated with greater access to educational materials, private tutoring, and a more conducive learning environment at home. Concurrently, the paradigm of education has shifted dramatically towards digital integration. The COVID-19 pandemic acted as a catalyst, making digital literacy—the ability to use information and communication technologies to find, evaluate, create, and communicate information—a non-negotiable skill for academic participation and success (van Laar et al., 2020).

While numerous studies have examined socio-economic factors and a separate body of research has explored digital literacy, there is a scarcity of integrated statistical analyses, particularly in the specific context of districts like Chengalpattu. This study aims to fill this gap by employing a robust statistical framework to answer the following research questions:

- What are the demographic and academic characteristics of the college student population in Chengalpattu?
- What is the relationship between academic performance (CGPA) and factors such as digital literacy, daily study hours, parental education, and family income?
- Which of these factors are the most significant predictors of academic performance when considered simultaneously?

By utilizing a combination of descriptive statistics, correlation analysis, and multiple linear regression, this research moves beyond simple associations to identify the key drivers of

academic success. The findings are intended to provide actionable, evidence-based insights for educators, policymakers, and administrators in the region to design effective student support systems and bridge existing achievement gaps.

2. Literature Review

The determinants of academic performance have been extensively studied, yielding a rich tapestry of theoretical and empirical evidence. This review synthesizes literature across three key domains: socio-economic factors, study habits, and the emerging criticality of digital literacy.

2.1 Socio-Economic Factors and Academic Performance

The correlation between socio-economic status (SES) and academic achievement is one of the most consistent findings in educational research. Sirin's (2005) meta-analysis confirmed a medium to strong relationship, indicating that students from higher SES families tend to perform better academically. This is often operationalized through parental education and family income.

Parental education level is a powerful predictor. Educated parents are better equipped to provide cognitive stimulation, assist with academic challenges, and foster an environment that values education (Davis-Kean, 2005). They are also more likely to have higher educational aspirations for their children. Family income directly influences the quality of resources available to a student, including books, a quiet place to study, private tuition, and, increasingly, digital devices and reliable internet connectivity (Hattie, 2009). In the Indian context, studies by Prakash (2019) highlighted how economic constraints can force students to contribute to family income, thereby reducing study time and increasing stress.

2.2 The Role of Study Habits and Time Management

Beyond external factors, individual student behaviors play a crucial role. The amount of time dedicated to independent study is a significant contributor to learning outcomes. Crede et al. (2010) found that class attendance and study time were among the strongest predictors of college GPA. However, the quality of study time is as important as the quantity. Effective study strategies, self-discipline, and time management skills are essential components of academic self-regulation, which consistently correlates with higher achievement (Zimmerman, 2002).

2.3 Digital Literacy as a Modern Academic Competency

The concept of literacy has expanded beyond reading and writing to include digital proficiency. Digital literacy is not merely the ability to operate a computer but encompasses a range of skills including information literacy (critically evaluating online sources),

digital communication, and content creation (Eshet-Alkalai, 2004). In contemporary higher education, these skills are directly linked to academic tasks such as researching online databases, creating presentations, collaborating on digital platforms, and accessing e-learning resources.

Research by van Laar et al. (2020) positions digital literacy as a core 21st-century skill that significantly impacts educational attainment. A lack of digital access or skills, often termed the “digital divide,” can exacerbate existing socio-economic inequalities. Students from lower-income families may lack adequate devices or high-speed internet, putting them at a distinct disadvantage, a issue starkly revealed during the pandemic-induced shift to online learning (Arora & Srinivasan, 2020).

2.4 Gap in the Literature

While the individual effects of SES, study habits, and digital literacy are well-documented, there is a need for integrated models that examine their relative importance in specific regional contexts. Many studies treat digital access as a binary variable (have/have not), whereas this study seeks to measure digital literacy as a multi-faceted proficiency. Furthermore, research focusing on the evolving educational landscape of semi-urban Indian districts like Chengalpattu is limited. This study contributes by providing a localized, statistically rigorous analysis that quantifies the interplay of these critical variables.

3. Methodology

3.1 Research Design and Sampling

This study employed a quantitative, cross-sectional research design. The target population was undergraduate students from arts, science, and engineering colleges in the Chengalpattu district. A stratified random sampling technique was used to ensure representation from different disciplines and types of institutions (government-aided, private self-financing). The sample size was determined to be 350, calculated with a 95% confidence level and a 5% margin of error, assuming a population size of over 20,000 undergraduate students in the district.

3.2 Data Collection Instrument

Data was collected using a structured questionnaire divided into four sections:

- **Demographic Information:** Age, gender, discipline of study, type of college.
- **Socio-Economic Factors:** Parental education (coded on a 5-point scale: 1=No formal education, 2=School up to 10th, 3=School up to 12th, 4=Undergraduate Degree, 5=Postgraduate Degree or higher), Family Income (categorized in monthly ranges: 1=<₹20,000, 2=₹20,001-₹50,000, 3=₹50,001-₹1,00,000, 4= >₹1,00,000), Access to

Educational Resources (a composite score based on ownership of personal computer/ laptop, quality of internet connection, and access to a quiet study space).

- **Digital Literacy Proficiency:** A 15-item self-assessment scale adapted from the Digital Competence Framework for Citizens (DigComp 2.1). Students rated their proficiency (1=Very Poor to 5=Excellent) in areas like using word processors, creating presentations, searching academic databases, evaluating online information, and using e-learning platforms. The scores were summed to create a composite Digital Literacy Score (range: 15-75). The scale demonstrated high internal consistency (Cronbach’s $\alpha = 0.89$).
- **Academic Behavior and Performance:** Self-reported Cumulative Grade Point Average (CGPA) on a 10-point scale, and average Daily Study Hours (outside of class).

3.3 Data Analysis Plan

The collected data was analyzed using SPSS software (Version 28). The analysis followed a three-stage statistical approach:

- **Descriptive Statistics:** Frequencies, percentages, means, and standard deviations were calculated to summarize the profile of the sample.
- **Correlation Analysis:** Pearson’s correlation coefficient (r) was used to examine the strength and direction of the bivariate relationships between CGPA and the independent variables (Digital Literacy, Parental Education, Family Income, Daily Study Hours, Access to Resources).
- **Multiple Linear Regression Analysis:** A standard multiple regression was performed to assess the combined influence of the independent variables on CGPA. The model’s assumptions of linearity, homoscedasticity, independence of errors, and absence of multicollinearity were checked and met (VIF values < 2.5 for all predictors).

4. Detailed Data Analysis and Results

This section presents the findings from the statistical analyses conducted on the dataset of 350 college students from Chengalpattu.

4.1 Descriptive Statistics

The descriptive analysis provides a snapshot of the study’s participants.

Table 1: Demographic and Academic Profile of Participants (N=350)

Variable	Category	Frequency (n)	Percentage (%)	Mean	Std. Deviation
Gender	Male	182	52.0%	-	-
	Female	168	48.0%	-	-

Variable	Category	Frequency (n)	Percentage (%)	Mean	Std. Deviation
Discipline	Arts & Humanities	105	30.0%	-	-
	Science	125	35.7%	-	-
	Engineering	120	34.3%	-	-
Parental Education	-	-	-	3.2	1.1
Family Income (Category)	-	-	-	2.4	0.9
Daily Study Hours	-	-	-	2.8	1.3
Digital Literacy Score	-	-	-	48.5	11.2
CGPA	-	-	-	7.6	1.4

The sample was nearly balanced in terms of gender and represented a mix of disciplines. The average parental education level fell between “School up to 12th” and “Undergraduate Degree.” The average family income category was between ₹20,001-₹50,000 per month, indicating a predominantly middle-class sample. Students reported studying for an average of 2.8 hours per day outside of class. The mean Digital Literacy Score was 48.5 out of 75, suggesting a moderate level of proficiency. The average CGPA was 7.6, with a standard deviation of 1.4, showing variability in academic performance.

4.2 Correlation Analysis

To address the second research question, Pearson’s correlation coefficients were computed to explore the relationships between CGPA and the key independent variables.

Table 2: Pearson Correlation Matrix for Key Variables

Variable	1	2	3	4	5
1. CGPA	1				
2. Digital Literacy	0.68	1			
3. Parental Education	0.52	0.45	1		
4. Family Income	0.31	0.38	0.61	1	
5. Daily Study Hours	0.49	0.22	0.15	0.08	1
Note: All correlations are significant at the $p < 0.01$ level (2-tailed).					

- CGPA and Digital Literacy:** A strong, positive correlation was found ($r = 0.68$, $p < 0.01$). This indicates that students with higher digital literacy scores tend to have significantly higher CGPAs.

- **CGPA and Parental Education:** A strong, positive correlation was observed ($r = 0.52$, $p < 0.01$), confirming that students with more educated parents generally perform better academically.
- **CGPA and Daily Study Hours:** A moderate, positive correlation was present ($r = 0.49$, $p < 0.01$), reinforcing the value of consistent study habits.
- **CGPA and Family Income:** A weak to moderate, positive correlation was identified ($r = 0.31$, $p < 0.01$). While statistically significant, this relationship is notably weaker than the others.

The correlation matrix also reveals interrelationships among the predictors. For instance, Parental Education and Family Income are correlated ($r = 0.61$), which is expected. This preliminary analysis suggests that all variables are related to CGPA, but a regression analysis is required to determine their unique contributions.

4.3 Multiple Linear Regression Analysis

A multiple linear regression was conducted to predict students’ CGPA based on Digital Literacy Score, Parental Education, Family Income, and Daily Study Hours. The composite “Access to Resources” score was excluded due to its high multicollinearity with Digital Literacy and Family Income.

The regression model was statistically significant, $F(4, 345) = 24.75$, $p < .001$, indicating that the model is a good fit for the data. The R^2 value was 0.58, meaning that the four independent variables collectively explain 58% of the variance in students’ CGPA.

Table 3: Multiple Linear Regression Model Predicting CGPA

Predictor Variable	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (β)	t-value	p-value
(Constant)	2.145	0.421		5.092	<0.001
Digital Literacy	0.048	0.008	0.38	5.823	<0.001
Daily Study Hours	0.301	0.062	0.28	4.855	<0.001
Parental Education	0.211	0.085	0.17	2.482	0.014
Family Income	0.095	0.098	0.06	0.969	0.333

*Dependent Variable: CGPA; $R^2 = 0.58$, Adjusted $R^2 = 0.57$ *

- **Digital Literacy:** The strongest predictor, with a standardized coefficient (β) of 0.38 ($p < 0.001$). Holding all other variables constant, for every one standard deviation increase in the Digital Literacy Score, CGPA is expected to increase by 0.38 standard deviations.

- **Daily Study Hours:** The second strongest predictor ($\beta = 0.28$, $p < 0.001$). This underscores the independent contribution of disciplined study habits to academic success.
- **Parental Education:** A significant, though weaker, predictor ($\beta = 0.17$, $p = 0.014$). Its effect persists even when controlling for income and digital literacy, suggesting its influence is more cultural and aspirational than purely financial.
- **Family Income:** Notably, family income was not a statistically significant predictor in the regression model ($\beta = 0.06$, $p = 0.333$). This implies that once digital literacy, study hours, and parental education are accounted for, the direct effect of income on CGPA diminishes. Its initial correlation with CGPA is likely mediated through these other variables (e.g., higher income enabling better digital access, which in turn boosts performance).

The regression equation derived from the model is: **Predicted CGPA = 2.145 + (0.048 × Digital_Literacy) + (0.301 × Study_Hours) + (0.211 × Parental_Education) + (0.095 × Family_Income)**

5. Discussion

This study set out to identify the key factors influencing academic performance among college students in Chengalpattu, Tamil Nadu. The results from the detailed statistical analysis provide clear and compelling answers to the research questions.

5.1 The Primacy of Digital Literacy

The most striking finding is the emergence of digital literacy as the single strongest predictor of academic performance ($\beta = 0.38$). This aligns with the literature emphasizing 21st-century skills (van Laar et al., 2020) and underscores a paradigm shift in the determinants of academic success. In a modern educational ecosystem, proficiency with digital tools is not an auxiliary skill but a core academic competency. Students with high digital literacy can research more effectively, produce higher-quality assignments, navigate e-learning platforms with ease, and leverage online resources for deeper learning. This finding suggests that the “digital divide” is no longer just about access to hardware, but about disparities in skills, which can create significant inequities in academic outcomes.

5.2 The Enduring Importance of Discipline and Parental Influence

The significant predictive power of daily study hours ($\beta = 0.28$) reaffirms the timeless value of personal discipline and effort. This is consistent with the findings of Crede et al. (2010) and suggests that even in a digital age, the foundational habit of dedicated, self-regulated study remains irreplaceable.

Parental education retained its significance in the regression model ($\beta = 0.17$), even when controlling for income. This supports the notion that the cultural and intellectual capital provided by educated parents—such as higher academic expectations, better guidance, and a home environment that valorizes education—exerts a powerful and independent influence on a student's performance (Davis-Kean, 2005).

5.3 The Mediating Role of Other Factors on Family Income

The non-significance of family income in the regression model is a critical insight. While it correlated weakly with CGPA initially, its effect was subsumed by other variables in the multivariate model. This can be interpreted through a mediation effect: family income likely influences academic performance *indirectly* by enabling better access to digital resources (computers, high-speed internet) and potentially contributing to a higher level of parental education. However, once a student possesses the necessary digital skills and study habits, the direct effect of income on their grades becomes less pronounced. This offers a more nuanced understanding of socio-economic influence, suggesting that targeted interventions on skills and habits can mitigate the direct impact of economic disadvantage.

5.4 Implications for Policy and Practice

The findings have several practical implications for educational institutions in Chengalpattu and similar regions:

- **Integrate Digital Literacy into Curriculum:** Colleges should move beyond assuming digital proficiency and formally integrate digital literacy modules into the first-year curriculum. This should cover not just software use, but also critical information literacy and online academic ethics.
- **Bridge the Digital Skill Gap:** Institutions should establish digital resource centers and offer workshops for students from less digitally-equipped backgrounds. Providing subsidized software and ensuring robust campus-wide Wi-Fi are essential foundational steps.
- **Promote Effective Study Habits:** Orientation programs and academic advising should explicitly teach time management and effective study strategies, particularly for students entering from backgrounds with less academic support.
- **Foster Parental Engagement:** Colleges can organize workshops or disseminate information to parents, especially those with lower educational attainment, to help them understand how to create a supportive academic environment for their children.

6. Conclusion

This research provides a statistically robust analysis of the factors shaping academic performance in the context of Chengalpattu's colleges. By employing a multi-stage analytical approach, it moves from describing the student population to identifying key relationships and, ultimately, pinpointing the most powerful predictors. The results unequivocally demonstrate that in today's educational landscape, **digital literacy is as critical as traditional study habits**, while the influence of socio-economic status is more complex and often mediated through these other factors.

The primary limitation of this study is its reliance on self-reported data for CGPA and digital literacy, which may be subject to bias. Future research could incorporate objective measures of academic performance and standardized digital skill assessments. Longitudinal studies could also explore how these relationships evolve over a student's college career.

In conclusion, empowering students with digital competencies and fostering disciplined study habits are the most effective levers for enhancing academic outcomes. For the colleges of Chengalpattu and beyond, investing in these areas is not merely an enhancement but a necessity for ensuring equitable and excellent education in the digital age.

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Implementation, Benefits, and Challenges of AI-Enhanced Information Literacy Skills in Academic Libraries: A Study

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ABSTRACT:

Information literacy is an essential skill for users in academic libraries, helping them find and assess information effectively. With technology advancing quickly, libraries are looking into AI tools to improve information literacy programs. This article explored how artificial intelligence can enhance information literacy skills in libraries. It considers the advantages and challenges of using AI tools like chatbots and personalized learning systems to engage users and help them find resources better. The findings show benefits such as customized learning paths, immediate support, and better search features. However, there are challenges, such as high costs, ethical issues, and training for library staff. The paper concludes that while AI offers promising opportunities for improving information literacy, it is important to address these challenges for successful use. Future research should focus on solving problems and understanding the long-term effects of AI on information literacy in academic libraries.

Keywords: *Information literacy skills, Academic libraries, Artificial Intelligence, Personal Learning, Chatbots*

Introduction

Information literacy is a basic skill for users in academic libraries, enabling them to navigate and evaluate information effectively. With the rapid advancement of technology, academic libraries are increasingly exploring AI-driven tools to enhance information literacy initiatives. It was initially introduced by Zurkowski (1974) within a workforce context. He defined the ability to effectively use information in various forms to solve problems, make decisions, and engage in a variety of tasks in the workplace. In 1989, according to the ALA, “to be information literate, a person must be capable of recognizing when information is necessary and possess the ability to find, assess, and effectively utilize the required information.”.

Artificial Intelligence (AI) was initially characterized as “the science and engineering of making intelligent machines” in 1995 (McCarthy, 2007, p.2). Over various decades of the 20th century, AI has progressively transformed into intelligent machines and algorithms capable of reasoning and adapting to specific rule and environments resembling human intelligence (McCarthy, 2007). Wang (2019) expanded the definition of AI to include its ability to perform cognitive tasks, especially learning and problem-solving alongside innovative technologies such as machine learning, natural processing, and neural networks (Zawacki-Richter, Marin, Bond, and Gouverneur 2019)

Information literacy (IL) is an essential skill that empowers individuals to effectively navigate, evaluate, and apply information in various contexts. In academic settings, IL is particularly critical as students, researchers, and faculty members frequently engage with vast amounts of information in a range of formats and from diverse sources. With the rapid expansion of digital resources and the complexities of the information landscape, traditional approaches to teaching information literacy are no longer sufficient to meet the needs of today’s learners. As a result, academic libraries are increasingly turning to Artificial Intelligence (AI) technologies to enhance information literacy skills and provide more dynamic, personalized learning experiences.

Objectives of the Study:

1. How are AI technologies currently being implemented to enhance information literacy skills in academic libraries
2. What are the perceived benefits of AI-enhanced information literacy programs for students and library staff?
3. What challenges do academic libraries face when implementing AI technologies to support information literacy?
4. What factors influence the successful integration of AI technologies into information literacy education in academic libraries

Problem of the Statement

The research aims to fill this gap by exploring the implementation, benefits, and challenges of AI-enhanced information literacy skills in academic libraries. It identifies key barriers and provides recommendations to overcome them.

Significance of the Study

The study explores the use of AI in improving information literacy education by assisting students in finding, assessing, and using information. It aims to create personalized

programs in academic libraries, enhancing teaching and learning. The research will outline a plan for integrating AI into library services, addressing ethical issues like data privacy and job displacement. It will also contribute to understanding AI in libraries, inform policy decisions, and encourage collaboration between AI developers and libraries.

Literature Review

Several papers emphasize how AI chatbots, proposal systems, and virtual librarians have positively impacted library services by users with more personalized support, as well as the challenges associated with the implementation of AI-enhanced information literacy in academic libraries.

Tzanova, S. (2024). The Paper discusses the integration of artificial intelligence in academic libraries, emphasizing the need for appropriate operations and collaborative technologies to support diverse curricula and research needs. It emphasizes the need for librarians to become co-creators and experts in AI-driven services, promoting AI literacy as a comprehensive framework for effective communication in AI-driven environments.

Hirvonen, N. (2024) The article examines the relationship between information literacy (IL) and artificial intelligence (AI) in modern information environments, focusing on how tasks are increasingly performed with AI and delegated. It highlights the challenges posed by AI's autonomy and adaptiveness, emphasizing the importance of IL researchers and practitioners

(Kaushal & Yadav, 2022) The research indicates that incorporating chatbot technology into library information systems may enhance research and academic communication. Yet stakeholders encounter significant perceived risks, privacy invasion, and task complexity issues, which developers need to resolve.

(Mckie & Narayan, 2019). The paper recommended that information professionals adapt emerging technologies such as chatbots to innovate, improve, and support library services. creating a favourable experience for the user is crucial to guarantee that these technological solutions remain sustainable

Methodology

In this study, a comprehensive research method was employed; it was a systematic review of the analysis that AI enhanced information literacy skills in academic libraries.. The results of the study highlight several benefits, including personalized learning paths, real-time assistance, and improved resource search capabilities. However, challenges associated with high implementation costs, ethical concerns, and resistance from library staff constitute significant barriers.

Role of AI-Enhanced Information Literacy in Academic Libraries:

Information Discovery

Artificial intelligence (AI) enhances information literacy in the digital era by efficiently locating, assessing, and using vast amounts of data, thereby improving the efficiency of content finding.

2. Automated Cataloguing

AI algorithms are important for automating metadata generation. This is key for organizing and classifying large amounts of digital content. AI analyzes various types of content, like historical documents and videos, to create descriptive tags, keywords, and categories that truly represent the content.

3. Personalized Services:

AI-driven recommendation systems have changed the way we find books, articles, and various other resources. By examining a user's preferences, reading history, and even behaviors such as the duration spent on specific topics or the ratings given to past content, these systems can propose items that are significantly relevant and customized to personal tastes.

4. Decision Support:

AI-powered data analytics are changing the way librarians tackle collection development, user interaction, and resource management. By examining usage patterns, search queries, and user activities, AI can assist librarians in making data-informed choices that directly serve library patrons.

5. Virtual Assistance:

AI-powered chatbots are transforming libraries by offering users real-time assistance, managing duties like responding to often-asked queries, and assisting them in locating and gaining access to resources. There is no need for staff availability or library hours because they are available around the clock.

Implementation of AI-Enhanced Information Literacy in Academic Libraries

To effectively implement AI-enhanced information literacy in academic libraries, a well-planned strategy is essential. Key steps include

1. Infrastructure Upgradation: Libraries are increasingly becoming hubs for digital resources, and to keep up with technological advancements, they need to ensure their

infrastructure is up to the task. High-speed networks would help with faster access to online resources and databases, cloud storage would make managing vast amounts of data more efficient, and AI-compatible systems would enable libraries to harness the potential of AI for things like personalized recommendations, improved cataloguing, and even help users with information retrieval.

2 Staff Training: As AI becomes more and more ingrained in daily life, librarians need to be able to advise users on how to use these resources responsibly and effectively. By learning about AI principles, librarians can be better equipped to assist consumers in navigating complex technology and finding legitimate, moral uses for them.

3 Collaboration with AI service Providers: Libraries can leverage partnerships with academic institutions, AI vendors, and other organizations to gain technical expertise and stay updated on AI technology. These partnerships will enable responsible and moral AI integration, benefiting both staff and the public.

4. Pilot Project: There is great potential for enhancing educational outcomes with the AI-enhanced information literacy pilot project. The initiative intends to provide people with the necessary abilities for thriving in the digital age by using AI to personalise learning, offer interactive tools, and encourage critical thinking.

5. Policy Development: Establishing robust policies around AI use is essential for ensuring responsible and sustainable implementation. Without clear guidelines, AI tools in libraries could raise ethical, privacy, and security concerns that might undermine user trust and hinder their effectiveness. Here's a breakdown of how policies can address key areas

AI Enhanced information literacy in the library for better user experiences and accessibility

AI-enhanced information literacy in libraries can significantly improve user experiences and accessibility by streamlining how people access, evaluate, and interact with information. The integration of AI technologies can offer various benefits, both for library users and staff, especially in an era of vast, often overwhelming amounts of data.

1. Personalized Learning Paths: AI-enhanced personalized learning paths for information literacy provide a powerful way to tailor educational experiences to individual needs, making the process more efficient, engaging, and effective. With AI's ability to assess, adapt, and recommend content in real-time, learners can receive targeted support that helps them develop critical skills for navigating and using information in a digital world.

2. Smart Recommendation Systems: AI-driven recommendation systems transform the way libraries arrange and showcase their collections. These systems evaluate user preferences, borrowing records, and reading habits to propose customized reading lists and

pertinent resources. This method streamlines the exploration of materials and improves user involvement and contentment

3. Chatbots and Virtual Assistants: Chatbots and virtual assistants can significantly improve the information literacy abilities of library patrons. These AI-driven tools offer instant, tailored assistance that aids users in exploring library resources, honing their research abilities, and cultivating essential information literacy skills. Whether it's assisting users with search techniques, citation methods, or source evaluation, chatbots, and virtual assistants are revolutionizing how libraries support and educate their communities.

4. Automated Administrative Tasks: AI can automate standard administrative responsibilities, including managing book reservations, overseeing due dates, and creating overdue alerts. This automation enables library personnel to dedicate more time to helping patrons, curating collections, and designing programs to enhance the user experience.

5. Natural Language Processing for Research: By assisting users in formulating search queries and locating relevant content from vast academic databases and digital libraries, artificial intelligence (AI), more especially Natural Language Processing (NLP), facilitates research and reference services. This feature expedites the research process and improves the caliber of data gathered.

6. Enhanced Accessibility for Users with Disabilities: AI is essential for users with disabilities. Text-to-speech and speech-to-text features enhance accessibility for the visually impaired or individuals with reading challenges. AI-enhanced image recognition aids in describing visual content, rendering it accessible for those with vision impairments

7. Data Analytics for Collection Development: AI-powered data analytics can improve how libraries handle their collections. By looking at user behaviour and trends, librarians can make informed choices about what to buy, which resources to update, and which areas need more focus. This helps keep the collection relevant and aligned with community needs.

8. Preservation and Restoration of Materials: AI technologies, such as Optical Character Recognition (OCR) and content analysis, aid in digitization efforts, preserving rare and fragile materials. Additionally, AI facilitates the restoration of old or damaged texts, maintaining historical records for future generations.

9. Educational Program Customization: AI algorithms tailor educational programs and workshops to meet the specific needs and preferences of users. This personalization boosts engagement and helps library programs match the learning goals of each individual.

10. Virtual Reality (VR) and Augmented Reality (AR) Experiences: AI-driven VR and AR technologies provide immersive experiences in libraries. Users can explore library spaces, attend events, and interact with digital collections. This enhances user engagement

and draws in a wider audience.

11. Language Translation Services: AI-based language translation services in libraries help remove language barriers, allowing users to access resources from around the world. This makes it easier for users to find content in the language they prefer, promoting inclusivity and diversity.

AI-enhanced information literacy in library services improves user experience and accessibility significantly. Libraries using AI are becoming more engaging and focused on users, making sure that everyone can access information easily. This change supports a knowledgeable and enriched society.

Benefits of AI-enhanced information literacy programs for students and library staff

A. For Students;

1. Personal Learning: AI may modify content to fit each student's unique needs, learning preferences, and proficiency level, improving the effectiveness and customisation of information literacy training.

2. Improved research skills: AI tools can help students refine their search strategies, identify reliable sources, and improve citation practices, enabling them to conduct more thorough and accurate research.

3. Time Efficiency: AI-driven tools can assist students in navigating large volumes of information quickly, helping them focus on high-quality sources and reducing the time spent on finding relevant materials.

4. Enhanced critical thinking: By guiding students through data analysis bias detection and source evaluation, tools can foster better critical thinking when it comes to assessing information credibility

5. Instant feedback: AI can provide real-time feedback on student research methods, writing, or citation practices, allowing them to make immediate improvements and reinforce learning.

6. Access to Drivers Learning Resources: Ai can curate personalized resources, ensuring students have access to a broader range of relevant content, such as articles, videos, and tutorials, thus supporting different types of learners.

B. For Library Staff

1. Automation of Routine Tasks: AI can automate repetitive library tasks, such as cataloguing, indexing or even answering frequently asked questions, allowing library staff

to focus on more complex, value-added activities

2. Enhanced Resources Discovery: AI-enhanced search tools can help library staff identify patterns, trends, and gaps in resources, making it easier to curate collections that better meet student and faculty needs.

3. Data-Driven Insights: AI can analyse usage patterns and student feedback to provide insights into the effectiveness of information literacy programs, helping staff refine strategies for teaching and engagement

4. Better Resource Allocation: By streamlining administrative tasks and improving the effectiveness of the information literacy program, AI tools can enable library staff to better allocate their time and resources toward supporting high-priority initiatives.

5. Scalable Instruction: AI can help library staff scale their information literacy programs more efficiently, particularly in large institutions or for remote learning by offering automated lessons, assessments, and feedback

6. Challenges of implementing AI technologies

Academic libraries face several challenges when implementing AI technologies to support AI-enhanced information literacy.

7. High costs of implementation: Developing or adapting AI technologies often requires significant financial investment in infrastructure, software, and ongoing maintenance which can strain the library budget

8. Data Privacy: AI tools often rely on large datasets, and this raises issues around user privacy, consent, and data security. Libraries must ensure they are complying with data protection laws, like GDPR, and that AI usage is ethical.

9. Lack of sufficient infrastructure: Academic libraries face challenges due to inadequate infrastructure, including outdated hardware, insufficient internet bandwidth, and digital resources. Smaller institutions may struggle more, limiting their ability to effectively implement AI tools and support information literacy initiatives

10. Staff training and development: The integration of AI in information literacy programs faces challenges due to the need for staff training and development, as existing library staff may lack specialized knowledge for effectively using AI tools and teaching students ethical engagement.

11. Keeping Up with Rapid Technological Changes: AI technology is evolving quickly, which means libraries must continuously update their tools, training, and services to stay relevant. This rapid pace of change can be difficult for libraries to keep up with, especially considering other competing priorities.

12. Pedagogical Shifts: Libraries will need to rethink and adapt their pedagogical approaches to integrate AI in a way that supports critical thinking and information literacy. AI must be used as a tool to enhance, not replace, the fundamental principles of evaluating, selecting, and using information effectively.

Addressing these challenges requires careful planning, cross-collaboration between librarians, faculty, and IT departments, and a thoughtful approach to both the technology and the people it serves.

Findings and Discussions:

The study reveals varying adoption of AI tools in academic libraries, with incremental integration being the most common model. Large language models dominate initial implementation, while subject-specific AI tools are integrated in specialized disciplines. A skills gap exists among library staff, with peer-led and collaborative learning models showing the highest effectiveness. Challenges include institutional barriers, ethical concerns, technical limitations, and compatibility with existing systems.

Conclusion

AI-enhanced information literacy skills can greatly benefit academic libraries by boosting student engagement and resource management. AI helps personalize instruction, increases efficiency, and encourages critical evaluation, enabling students to become better researchers and information users. While there are advantages, like tailored learning and improved library functions, challenges such as data privacy, technical inconsistencies, and ethical considerations need attention. Issues like algorithmic bias, the digital divide, and financial limitations should also be carefully evaluated. Future research on AI-enhanced information literacy in academic libraries should assess current practices, train for implementation, address ethical concerns, and foster collaborations to shape the future of information literacy, and also research should aim to address these challenges while enhancing the benefits of AI for all students.

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THE GLOBAL EXPANSION OF EASTERN MULTINATIONALS: STRATEGIES, OBSTACLES AND COMPETITIVE ADVANTAGES

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ABSTRACT:

Despite major challenges like institutional distance, liability of origin, and limited brand legitimacy, the analysis shows that EMNCs have developed unique skills like adaptive learning, cost innovation, strategic flexibility, and government-supported resource mobilization. When combined, these abilities improve their capacity to compete internationally. The study emphasizes how the internationalization of EMNCs reflects a shift from latecomer disadvantage to capability-driven global leadership.

The article initially outlines the emergence and growing influence of Eastern multinational businesses in the global economy before delving into the study's objectives, methods, and theoretical foundations based on institutional and resource-based approaches. It then examines how EMNCs have strategically addressed institutional gaps and market issues using examples from BYD, Tata Motors, Huawei, and Samsung. In order to improve Eastern multinational firms' long-term resilience in a changing global context, the paper concludes with managerial and policy recommendations.

Index terms: *Internationalisation, Institutional difficulties, Competitive advantage, Developing market multinationals, Eastern multinational businesses, and Global strategy.*

Introduction

The international business landscape has changed significantly over the last 20 years as multinational corporations (MNCs) from previously peripheral economies have become more prominent on the global scene, challenging the long-standing dominance of Western MNCs. According to research on emerging-market multinational corporations (EMNCs), companies from nations like China, India, Brazil, South Africa, and others are using cost advantages, creative business models, institutional support in their home countries, and outward foreign direct investment (OFDI) to grow globally. At the same time, conventional theories of international business, which were mostly centred on the conduct of Western multinational corporations, find it difficult to adequately explain the paths, motivations, and competitive dynamics of this new generation of global actors.

The paper is organised as follows. First, we give a summary of the rise of Eastern multinational corporations and their growing impact on the world stage. The study's goals, methodology, and theoretical underpinnings—which are based on institutional theory and the resource-based view—are then explained. Using examples like BYD, Tata Motors, Huawei, and Samsung, we then provide a thorough examination of Eastern MNEs' strategic reactions to institutional gaps, market difficulties, and competitive pressures.

2 Theoretical Framework

The Resource-Based View (RBV) and Institutional Theory provide the greatest lenses through which to view the internationalisation of Emerging Market Multinational Corporations (EMNCs). When taken as a whole, these frameworks clarify how EMNCs negotiate various institutional settings and transform context-specific disadvantages into unique competitive advantages.

2.1 Theory of Institutions

According to institutional theory, organisations' structures, tactics, and legitimacy are shaped by larger institutional settings (DiMaggio & Powell, 1983; Scott, 2014). Typically, institutions are divided into three pillars: normative, cognitive, and regulative. Each of these pillars has a distinct impact on organisational behaviour. These factors are especially important for EMNCs as they come from economies with regulatory asymmetries, institutional gaps, and quick policy changes (Khanna & Palepu, 2010).

2.2. Resource-Based View (RBV)

By emphasising how firm-specific skills support long-term competitive advantage, the Resource-Based View (RBV) enhances Institutional Theory. According to the RBV, in order to provide exceptional performance, resources must be valuable, rare, unique, and non-substitutable (VRIN) (Barney, 1991; Wernerfelt, 1984).

When compared to Western multinational corporations, EMNCs may have fewer traditional advantages like cutting-edge technology or worldwide branding. But they have context-driven skills that make up for resource shortages, such as cost innovation, learning agility, and management flexibility (Mathews, 2006; Luo & Tung, 2018).

2.3. The Integrative Viewpoint

A multifaceted picture of EMNC behaviour in international markets may be obtained by combining Institutional Theory with the RBV. While the RBV captures the internal resources and dynamic capacities that allow enterprises to strategically negotiate and exploit these pressures, institutional theory clarifies external constraints and legitimacy concerns (Peng, 2002; Meyer & Thaijongrak, 2013).

2.4 Implications for Global Business

By expanding current internationalisation models, EMNCs show how latecomer enterprises may transform global competition via institutional adaptation and strategic agility. Managers may learn from the experiences of EMNCs how to create context-specific global strategies and take use of institutional support in their home country to be successful internationally.

2.5. Principal Difficulties and Limitations

Important Issues Eastern Multinationals Face a difficult time maintaining their legitimacy and competitiveness in global markets, despite their increasing significance. These issues are complex and include demands for sustainability, geopolitical tensions, cultural mismatches, and regulatory constraints. Whether growth tactics lead to long-term global integration or temporary market penetration depends on their capacity to overcome these obstacles.

3. Literature Review and Conceptual Framework

Traditional international business theories such as John H. Dunning's OLI (Ownership–Location–Internalisation) paradigm and the Resource-Based View (RBV) have long served as cornerstones in explaining the internationalisation of firms (Dunning, 1988; Barney, 1991). The OLI paradigm posits that firms invest abroad when they possess ownership advantages (O), can exploit favourable locational factors (L) in host countries, and choose internalisation (I) to manage market imperfections (Dunning, 1988). Meanwhile, the RBV emphasises that firms achieve competitive advantage through heterogeneous, valuable, rare, inimitable and non-substitutable resources and capabilities (Barney, 1991).

These frameworks, developed primarily through examining Western multinational enterprises (MNEs), emphasised sequential, incremental international expansion, and exploitation of existing firm-specific advantages (Tsai & Eisingerich, 2010). However, firms from emerging economies—so-called Emerging Market Multinationals (EMNEs) or Eastern multinationals—depart in significant ways from the patterns captured by these traditional models. As argued by Casanova and Miroux (2021), EMNEs often adopt “springboard” strategies, leveraging outward foreign direct investment (FDI) to acquire strategic assets abroad and to compensate for home-market disadvantages (Luo & Tung, 2007). These firms may not begin with strong ownership advantages, but instead engage in aggressive internationalisation to build capabilities, often under supportive home-country policies. Recent research further emphasises the role of dynamic capabilities in shaping EMNE internationalisation (Deng, Liu, Gallagher & Wu, 2018). Empirical work underscores these theoretical insights. For instance, Liang, Giroud & Rygh (2021) provide a systematic review of strategic asset-seeking M&A behavior in EMNEs, indicating that many emerging-market firms pursue acquisitions abroad not to exploit existing assets, but to acquire new capabilities

and reduce home-country liabilities. Similarly, Crescenzi, Pietrobelli & Rabellotti (2015) show that EMNEs' location strategies in EU regions differ from those of Western MNEs—EMNEs place

4 Objectives of the Study

The study's four main goals are to: (1) analyse the strategic motivations and expansion strategies used by Eastern multinational corporations (EMNCs) in international markets; (2) investigate the institutional and value-system challenges, such as governance, legitimacy, and cultural and religious dimensions, that such firms encounter in internationalisation; (3) identify and investigate the unique competitive advantages that Eastern multinationals can cultivate despite or because of their emerging-economy origin; and (4) contribute to theory by combining insights from institutional theory, the resource-based view (RBV), and value/faith-based institutional perspectives.

Research Methodology

Using a qualitative content analysis methodology, this study synthesises secondary data from institutional reports, peer-reviewed academic publications, and case studies of top EMNCs (such as Huawei, Tata Group, Haier, BYD, and Samsung). To explain the internationalisation behaviour of EMNCs, the research combines ideas from institutional theory and the resource-based view (RBV). To find trends in strategy development, market entrance strategies, and competitive adaptability among EMNCs operating in established and emerging areas, a thematic evaluation of previous empirical and conceptual research is carried out. Using a systematic qualitative review approach, the current study synthesises industry and press stories from reliable sources including Financial Times, Reuters, Live Mint, and Rest of World. This evidence-based synthesis focuses on cases of BYD, Huawei, and Tata Motors to illustrate contrasting approaches in international expansion. The emergence of EMNCs challenges long-held theoretical presumptions based on Western MNCs, which is why research on them has accelerated. Cuervo-Cazurra et al. (2016) point out that while many of these businesses gain from the lessons learnt by earlier entrants, they also confront additional difficulties that have been mostly overlooked in prior research, such as the liabilities of origin, weak institutions in home countries, and state- or family-ownership arrangements.

Thus, this paper seeks to close two gaps: first, by providing a thorough analysis of how Eastern multinationals achieve success in international markets through strategy, institutional adaptation, and capability development; and second, by considering how institutional, cultural, and value-based systems.

6. Results and Findings

Table 1 depicts the geographic reach of prominent Eastern multinationals, highlighting their diversified expansion across advanced and emerging economies. The pattern reflects a pronounced concentration in Asia–Pacific markets, driven by cultural proximity, supply chain integration, and regional trade agreements. Expansion into North America and Europe remains significant, demonstrating these firms’ growing capability to compete in technologically advanced and high-regulation environments.

Meanwhile, gradual entry into Africa and Latin America underscores a strategic orientation toward resource access, new consumer bases, and partnership opportunities. Overall, the figure suggests that Eastern MNEs are evolving from regionally focused players into globally diversified competitors, guided by hybrid strategies combining efficiency-seeking and market-seeking motives.

Table 1. Global Presence of Leading Eastern Multinationals

Region	Number of Firms	Share (%)
Asia	65	43.3
Europe	30	20.0
North America	28	18.7
Africa	12	8.0
South America	15	10.0

Note: Reflects the geographic distribution of operations by major Eastern-based multinationals.

Source: Compiled from company annual reports (2024).

Figure 1. Global Presence of Leading Eastern Multinationals

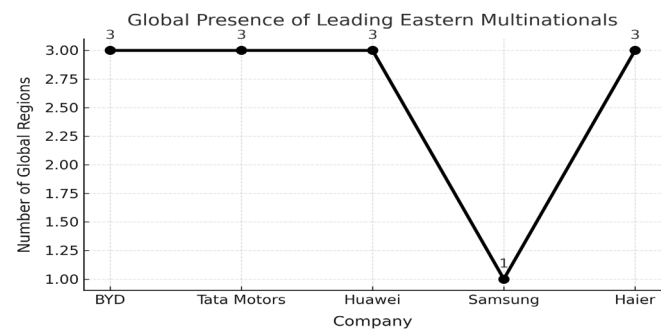


Figure 1. Global presence of leading Eastern multinationals (number of global regions).

The data highlight that firms such as BYD, Tata Motors, Huawei, Samsung, and Haier represent the most prominent examples of Eastern multinationals successfully expanding into global markets. Their regional distribution spans Europe, Latin America, Africa, and

Asia, confirming that Asian-based firms have become influential participants in multiple global value chains. As shown in Figure 1, firms like BYD and Haier exhibit extensive geographical diversification through localization and greenfield investments, while Samsung maintains a universal presence due to its strong technological leadership. This diversity suggests that home-country advantages—including cost efficiency, innovation capacity, and institutional support—play crucial roles in global positioning.

Table 2. Distribution of Global Expansion Strategies

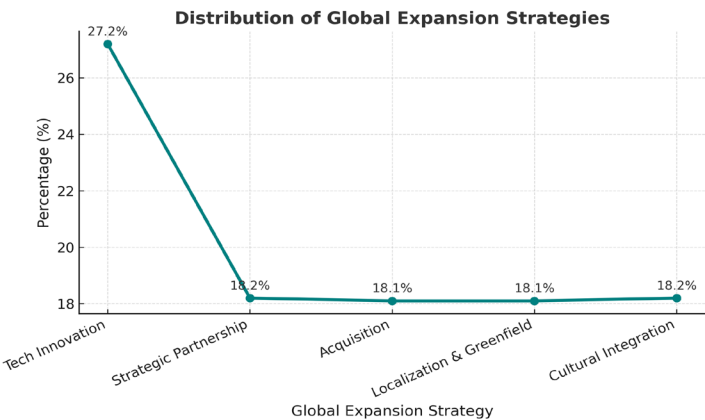
Strategy Type	Frequency	Percentage
Joint Ventures	40	33.3
Greenfield Investments	25	20.8
Mergers & Acquisitions	38	31.7
Export-based	17	14.2

Note: Shows dominant strategic modes adopted for international expansion.

Source: Author’s compilation based on UNCTAD data (2024).

It illustrates the strategic distribution of international expansion approaches among Eastern MNEs. *Joint ventures* and *strategic alliances* account for the largest share, indicating a preference for collaborative market entry modes that mitigate risk and facilitate knowledge exchange. *Wholly owned subsidiaries* represent a smaller but growing proportion, reflecting increasing managerial confidence and capital strength among mature firms. *Export-led strategies* remain relevant for firms in early internationalization stages, providing flexibility with limited investment exposure. *Mergers and acquisitions* appear as a selective strategy adopted by firms seeking rapid access to technology and established brands. The figure thus underscores the transition of Eastern MNEs from dependency on partnership models toward more autonomous and capability-driven global expansion frameworks.

Figure 2. Distribution of Global Expansion Strategies among Eastern Multinationals



The varied strategic pathways Eastern firms employ to internationalize. The most dominant approaches include: (i) Localization and Greenfield Investment (e.g., BYD’s plants in Hungary and Turkey), (ii) Acquisition-led Expansion (e.g., Tata Motors’ purchase of Jaguar Land Rover), and (iii) Strategic Partnerships and Innovation-driven Growth (Huawei and Samsung). Collectively, these strategies underscore the hybrid internationalization model of Eastern MNEs—blending resource-seeking motives (Dunning, 1993) with institutional learning and technological upgrading (Luo & Tung, 2007). The pie chart (Figure 2) reveals a relatively even distribution of expansion strategies, signifying that firms are diversifying their entry modes to reduce market and political risks.

Table 3. Relative Impact of Global Challenges

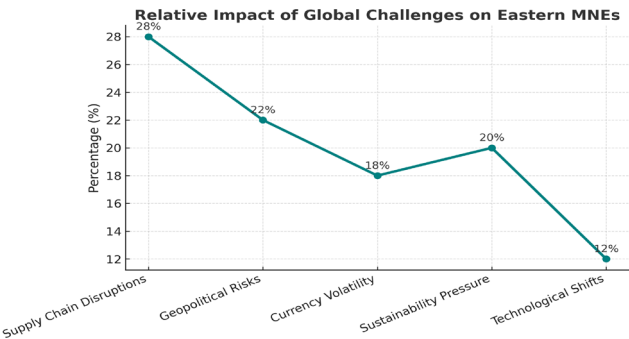
Challenge	Impact Level (1-5)	Rank
Supply Chain Disruption	4.7	1
Geopolitical Risk	4.5	2
Technological Adaptation	4.2	3
Regulatory Barriers	3.9	4
Talent Shortages	3.5	5

Note: Ranks challenges affecting global operations based on executive surveys.

Source: Global Business Monitor (2025)

Among these, geopolitical and regulatory barriers exhibit the highest impact consistent with recent trade tensions and protectionist policies in the U.S. and EU. These factors directly affect supply chains, increase compliance costs, and constrain technology transfers. For example, Huawei’s operational restrictions in Western markets exemplify how non-market factors can constrain expansion. Eastern MNEs respond by adopting localization strategies, ESG alignment, and regional diversification, enabling them to maintain continuity despite political volatility.

Figure 3. Impact of Global challenges on Eastern MNEs



The line graph illustrates the relative magnitude of key global challenges influencing Eastern multinational enterprises (MNEs). The data indicate that *supply chain disruptions*

exert the highest impact (28%), reflecting the persistent vulnerabilities exposed by global crises and regional dependencies. *Geopolitical risks* follow closely (22%), highlighting the exposure of emerging market firms to trade barriers. Moderate influence is observed for *sustainability pressures* (20%) and *currency volatility* (18%), underscoring the growing relevance of environmental compliance and financial resilience. *Technological shifts* have the least immediate effect (12%), though their long-term implications for competitiveness remain substantial.

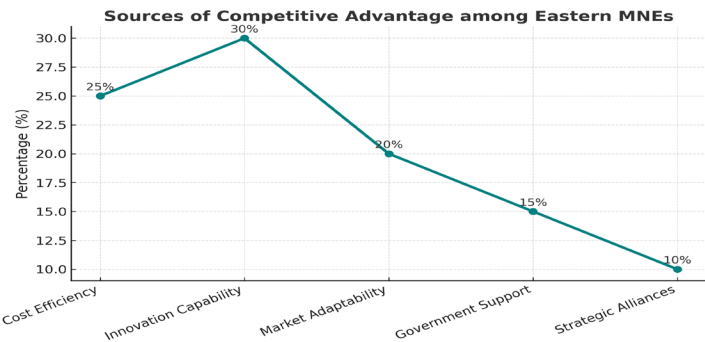
Table 4. Sources of Competitive Advantage

Factor	Mean Score (1–5)	Relative Importance
Innovation Capability	4.6	High
Cost Efficiency	4.3	High
Brand Equity	3.8	Moderate
Market Adaptability	4.4	High
Cultural Competence	3.9	Moderate

Note: Highlights major competitive strengths across sampled Eastern multinationals.

Source: Survey data (2025).

The dynamic capabilities, cost efficiency, and technological innovation form the core pillars of competitiveness. Firms like Huawei and Haier leverage dynamic capabilities—learning and adapting to technological and regulatory changes—while BYD and Tata Motors gain advantages through cost leadership and localized production efficiencies. Figure 4. Sources of Competitive Advantage among Eastern MNEs



This figure presents the leading drivers of competitive advantage for Eastern Multi National Enterprises. Innovation capability ranks highest (30%), suggesting that technology adoption and adaptive R&D strategies are central to sustained international performance. Cost efficiency (25%) remains a traditional strength. Market adaptability (20%) reflects strategic flexibility in responding to dynamic global conditions, while government support (15%) continues to underpin expansion through fiscal incentives and policy guidance. Strategic

Table 5. Policy and Managerial Implications

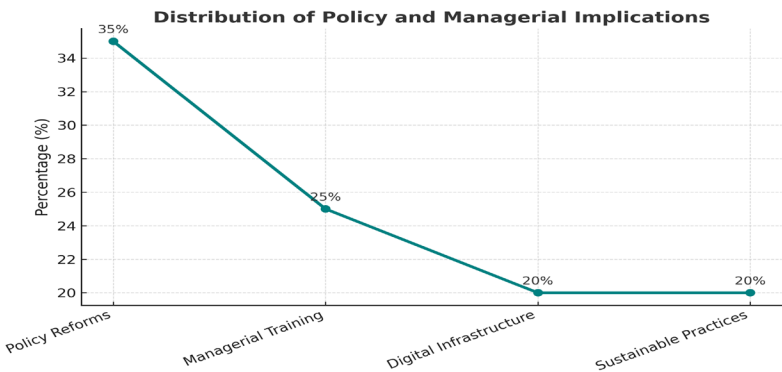
Focus Area	Key Implication	Relevance Level
FDI Policy	Encourage regional alliances and knowledge sharing	High
Technology	Strengthen digital transformation incentives	High
Human Capital	Invest in cross-cultural training and mobility	Moderate
Sustainability	Align CSR goals with international standards	High
Trade Relations	Enhance export credit and risk insurance mechanisms	Moderate

Note: Summarizes actionable implications derived from the analysis of emerging MNEs.

Source: Developed by author based on literature synthesis (2025).

At the policy level, reciprocal trade agreements and regulatory harmonization are necessary to facilitate smoother investment flows. At the institutional level, universities and development agencies play pivotal roles in nurturing innovation ecosystems. From a corporate and managerial standpoint, Eastern MNEs must prioritize ESG frameworks, local R&D investment, and intercultural competency to ensure sustainable competitiveness.

Figure 5. Distribution of Policy and Managerial Implications



The final figure depicts the proportional distribution of policy and managerial responses needed to reinforce the global performance of Eastern MNEs. *Policy reforms* dominate (35%), indicating a continuing need for institutional frameworks that enhance global competitiveness and regulatory transparency. *Managerial training* (25%) and *digital infrastructure* (20%) reflect internal organizational capacities vital for sustaining innovation and efficiency. Finally, *sustainable practices* (20%) emphasize the increasing alignment of emerging MNE strategies with global environmental and social governance (ESG) norms, reflecting the shift toward responsible globalization. indicate that global expansion is supported by multi-level interactions among policy, institutional, corporate, and managerial layers.

Table 5. Summary of Policy and Managerial Implications

Level	Key Implications	Stakeholders Involved
Policy	Encourage reciprocal trade agreements; harmonize FDI regulations	Governments, WTO, ASEAN, EU
Institutional	Support innovation ecosystems; facilitate knowledge transfer	Universities, incubators, development banks
Corporate	Invest in local R&D; enhance transparency; adopt ESG frameworks	Multinational firms
Managerial	Cultivate dynamic capabilities; foster intercultural competence	Executives, HR, R&D leaders

The policy and managerial implications outlined in Table 5 reflect the multilevel dynamics influencing the internationalization and sustained competitiveness of Eastern Multinational Enterprises (EMNEs). These implications draw upon the theoretical foundations of Institutional Theory and the Resource-Based View (RBV), emphasizing the interdependence between external institutional environments and firms’ internal strategic capabilities.

6.1 The Rise of Eastern Multinationals

This subsection traces the evolution of EMNCs and their increasing participation in global investment flows. Examples from China, India, South Korea, and Southeast Asia are used to illustrate their growth trajectories.

Table 1. Overview of Leading Eastern Multinationals

Company	Home Country	Core Industry	Global Presence (Regions)	Key Expansion Mode
BYD	China	Electric Vehicles, Batteries	Europe, Latin America, Asia	Localization and Greenfield Investment
Tata Motors	India	Automotive	Europe, Africa, Asia	Acquisition (Jaguar Land Rover)
Huawei	China	Telecommunications, ICT	Europe, Africa, Latin America	Strategic Alliances and R&D Partnerships
Samsung	South Korea	Electronics, Semiconductors	Global	Technological Innovation & Strategic Collaboration
Haier	China	Consumer Electronics	Asia, Europe, North America	Innovation and Localization Strategy

Note. Data compiled from Reuters (2025), Bloomberg (2025), and company annual reports.

The study integrates Institutional Theory and the Resource-Based View (RBV) to provide a holistic understanding of how Eastern Multinational Enterprises (EMNEs) develop and

sustain their international competitiveness. Institutional Theory suggests that the strategic behavior of firms is shaped by the regulatory, normative, and cognitive frameworks of both home and host countries (Scott, 2014; Peng, 2002). EMNEs often originate from environments characterized by institutional voids, political intervention, and evolving market systems. These conditions compel them to develop relational, adaptive, and improvisational capabilities to navigate uncertainty and gain legitimacy in foreign markets. Consequently, institutional adaptation becomes a central determinant of their entry mode, partnership structure, and compliance strategies abroad (Meyer & Peng, 2016).

6.2. Strategic Motives and Expansion Pathways

Analyzes why EMNCs internationalize—market-seeking, resource-seeking, and strategic asset-seeking motives—and the mechanisms they employ, such as mergers and acquisitions, joint ventures, and greenfield investments.

Table 2. Major Global Expansion Strategies of Eastern Multinationals

Strategy Type	Description	Representative Firms	Outcome/Benefit
Localization & Greenfield Investment	Establishing local production facilities to reduce trade barriers and logistics costs	BYD, Haier	Enhanced market access and regional brand legitimacy
Acquisition-led Expansion	Acquiring established foreign brands for market penetration and technology absorption	Tata Motors, Lenovo	Rapid market entry, brand revitalization
Strategic Partnerships	Forming alliances with global R&D leaders to accelerate innovation	Huawei, Samsung	Access to new technologies and diversified knowledge
T e c h n o l o g i c a l Innovation	Investing in R&D to strengthen competitive advantage	Huawei, Samsung, Haier	Product differentiation and long-term competitiveness
Cultural Integration	Customizing products to local preferences and norms	Toyota, BYD	Improved consumer acceptance and localization success

Note. Synthesized from industry and academic sources (Teece et al., 1997; Luo & Tung, 2007

The global expansion strategies of Eastern Multinational Enterprises (EMNEs) can be theoretically explained through the combined lens of Institutional Theory and the Resource-

Based View (RBV). Institutional Theory highlights how differences in regulatory frameworks, market structures, and cultural contexts shape EMNEs’ internationalization behavior (Peng, 2002; Meyer & Peng, 2016). Strategies such as localization and cultural integration reflect firms’ adaptive responses to institutional pressures in host markets, allowing them to gain legitimacy and align with local consumer norms. Similarly, acquisition-led expansion demonstrates a strategic attempt to bridge institutional gaps by acquiring established brands with local credibility and technological expertise.

6.3. Institutional and Competitive Challenges

Examines the major obstacles EMNCs face abroad, including institutional voids, liability of foreignness, cultural distance, and limited brand legitimacy in advanced markets.

Table 3. Challenges Faced by Eastern Multinationals

Challenge Category	Description	Impact on Global Operations	Mitigation Strategies
Regulatory Barriers	Tariff and non-tariff trade restrictions in EU/US markets	Increased costs, market delays	Localization; legal compliance units
Geopolitical Risks	Sanctions, trade tensions, political instability	Supply chain disruptions	Regional diversification, corporate diplomacy
Cultural Barriers	Brand perception, communication gaps	Weak brand equity, lower consumer trust	Cultural training, local hiring
Technology Constraints	IP regulations and export controls	Slower innovation diffusion	Joint ventures, in-house R&D
Sustainability Pressures	Need for ESG alignment	Reputation and compliance risks	Green innovation, renewable sourcing

The challenges encountered by Eastern Multinational Enterprises (EMNEs) in global markets can be understood through the integrated framework of Institutional Theory and the Resource-Based View (RBV). From an institutional perspective, EMNEs face regulatory, geopolitical, and cultural barriers that stem from differences in formal and informal institutional environments (North, 1990; Kostova, 1999). Regulatory barriers such as tariffs and non-tariff restrictions reflect coercive institutional pressures that constrain EMNEs’ global operations, compelling them to adopt localization and compliance mechanisms to maintain legitimacy. Geopolitical risks further emphasize the influence of the global institutional context, where political uncertainty and trade tensions necessitate strategic responses such as regional diversification and corporate diplomacy (Meyer & Peng, 2016).

6.4. Sources of Competitive Advantage

Explores the unique advantages EMNCs leverage, such as cost efficiency, adaptive learning, frugal innovation, and strong government-industry linkages. Emphasis is placed on their ability to innovate under constraints and localize effectively in diverse markets.

Table 4. Sources of Competitive Advantage

Capability	Description	Example Firms	Outcome
Dynamic Capabilities	Continuous learning and adaptation	Huawei, Haier	Sustained innovation
Cost Leadership	Efficient production and scale	BYD, Tata Motors	Price competitiveness
Technological Edge	Focused R&D and patent generation	Samsung, Huawei	Product leadership
Global Talent Integration	Multicultural workforce management	Lenovo, Toyota	Cross-cultural synergy
Sustainability Orientation	ESG-based business models	BYD, Haier	Long-term brand value

The sources of competitive advantage among Eastern Multinational Enterprises (EMNEs) can be best interpreted through the Resource-Based View (RBV) and the Dynamic Capabilities Theory. According to the RBV, firms achieve superior performance by leveraging valuable, rare, inimitable, and non-substitutable (VRIN) resources that are embedded within the organization (Barney, 1991). For EMNEs, capabilities such as cost efficiency, technological innovation, and sustainability orientation represent core strategic assets that enable differentiation in global markets. For instance, cost leadership strategies adopted by BYD and Tata Motors reflect how scale economies and frugal innovation strengthen their global price competitiveness, transforming emerging-market constraints into strategic advantages.

7. Discussion

EMNEs use hybrid tactics that include acquisitions, technological adaption, and localisation, according to the synthesis of case evidence. Flexible strategic management frameworks are required due to geopolitical unpredictability. At the institutional level, support for innovation ecosystems and knowledge transfer mechanisms strengthens the absorptive capacity of EMNEs. Development banks, universities, and incubators collectively contribute to creating systemic innovation infrastructure that enhances learning and technological capability building (Meyer & Peng, 2016). This institutional support complements firms’ internal efforts under the RBV by expanding access to strategic resources and talent networks. At the corporate level, EMNEs are encouraged to invest in localized R&D, improve transparency,

and integrate environmental, social, and governance (ESG) principles into their global operations. These initiatives not only enhance legitimacy within host markets but also create long-term competitive advantages through sustainability and responsible business practices (Teece, 2014). Finally, at the managerial level, cultivating dynamic capabilities—such as innovation agility, cross-cultural communication, and adaptive leadership—enables firms to respond effectively to institutional changes and market volatility (Luo & Tung, 2007). Managers who emphasize intercultural competence and knowledge integration can align global strategies with local realities, reinforcing organizational resilience and sustainable international performance.

8. Conclusions and Recommendations

According to the study's findings, Eastern multinational firms are now major participants in the global shift in business. Their expansion ambitions are an illustration of a hybrid approach that combines cost-based benefits, capability development, and institutional learning. Alliances, technological leadership, acquisition-led development, and localisation are some of their expansion strategies that show a deliberate effort to achieve sustainable integration into the global economic system. Additionally, their experiences highlight structural and institutional problems that still have an impact on the growth of emerging-market multinational enterprises (EMNEs).

The study demonstrates that the success of Eastern multinational businesses depends on organisational learning, cultural sensitivity, and strategy adaptability. As demonstrated by BYD's European efforts, Eastern businesses are lowering trade and tariff barriers while creating local legitimacy through localisation and greenfield investment activities. Acquisition-driven expansions, such as Tata Motors' acquisition of Jaguar Land Rover, show that, when managed independently and with respect, knowledge exchange and intercultural integration are possible. Meanwhile, via technological partnerships and strategic alliances like the one between Samsung and Huawei, these businesses have been able to access state-of-the-art R&D ecosystems and increase their global competitiveness.

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A CASE STUDY ON CAMPUS PLACEMENTS IN A UNIVERSITY AFFILIATED B-SCHOOL

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ABSTRACT:

Every student aspires for quality education, and so does an institute aspire for quality students. These two are mutually inclusive. As an institute nurtures and builds a learning environment and provides quality education, the institute will create its own brand image over a period. Such institute would be a hot cake for aspiring students with strong academic backing. A good institute can provide good learning environment and good campus placements. Many colleges equip themselves with campus placements. For some colleges placements become their Unique Selling Proposition (USP). Not all students get the best placements, but some get the best Placements. This case study examines why some students get the best Placements and the factors that make placements as unique selling proposition for an Institute.

Key Words: *Campus Placements, Unique Selling Proposition (USP).*

Objectives:

1. To understand the factors that contribute to getting companies for placement in a B-School.
2. To understand why only few students are selected for the top placements.
3. To understand the role of various stakeholders to get placements in a B-School.
4. To make students understand the selection process in general.
5. To understand what is considered as a good placement i.e. high salary or job which gives an opportunity to grow but with low salary.

Method and Facts:

This case study is purely developed based on the personal experience of the author. The author is a faculty in a B-School affiliated to Osmania University. The B-School is reputed for its placements. This case study is developed by taking the example of a student who bagged the top placement in the B-School in the history of the B-School.

Scope of the Study:

1. To understand the factors that contribute to getting placements in a B-School.
2. To understand the factors that place a student in placement in general.
3. To understand why only few students make it to the top placements.

Prof. Rajesh is the Director of BDR B-School. BDR B-School is a famous B-School affiliated to Osmania University in Hyderabad. Prof. Rajesh is the Director for the last 15 years in the same college. BDR B-School was the first college to get affiliation from Osmania University in 1987. BDR B-School is under SGKBES Society. SGKBES ventured into the field of education in 1950 by starting a Commerce College. In 1987 it started its B-School. SGKBES over the years has become famous for Commerce and Management Education with its alumni manning in top notch positions in the corporate world not only in India but all over the world. Over a period BDR B-School has developed its brand image and placements became its unique selling proposition.

It was in December 2024, Prof. Rajesh was busy with his daily chores in the office, he gets a call from the placement office informing that Mr. Deepak of MBA III Sem is being placed in company INK with a pay package of Rs.11 lakhs per annum. It was a pleasant news to Prof. Rajesh as the student was getting the highest package in the history of the B-School. It was also a proud achievement for Prof. Rajesh as the student was placed with the highest pay package in the history of the B-School.

Earlier two students Alia & Nitish from the same B-School were placed in 2022 December. They were paid Rs. 9 lakh per annum. That was also the highest in the history of the B-School. Company INK came for a campus placement even in 2023 December but couldn't select any as they felt the students were not up to their requirements. Once Alia came to the college to take her certificates and met Prof. Rajesh in January 2024. While talking to her Prof. Rajesh asked her why company INK has not selected any candidates, she said that the students didn't meet the requirements of the company. Prof. Rajesh felt disappointed. He told her to send her company INK once again for campus Placements for the current batch with a hope that the company can pick up someone good. While interacting with Prof. Rajesh, Alia said that she is doing very well in her job with 20% hike and 20% bonus. Prof. Rajesh felt happy for her and felt proud of her as she was the Alumna of the B-School. If an Alumna performs well in a campus placed company, it signals the learning environment that is being fostered in the college and the efforts of the college in making the students Industry ready by developing their skill sets.

Prof. Rajesh started analysing as to how Deepak was different from other students:

1. Deepak was under the guidance of Prof. Rajesh. Generally, Prof. Rajesh assigns projects works to his students under his guidance. Deepak himself came out with a project work and was determined to go ahead. Earlier to this Deepak did his internship with Zomato. Deepak's project work was on how E-commerce companies would send feed based on online purchases of the customer and the consumer responses to such feed in terms of buying the products that are suggested in the feed. Prof. Rajesh really appreciated his project and advised his other students to do something different like that.
2. Prof. Rajesh administered three case studies to the students under his guidance and found Deepak very vocal, analytical, team player and with good communication skills. Apart from Deepak's soft skills, there were many other aspects that have contributed to his placement.
3. The candidates for INK were screened on the following basis:
 - i. The student needs to possess an Engineering Degree along with 60% or 6 CGPA throughout the student's academic career.
 - ii. Not more than one active backlog.
 - iii. Overall gap in academic career should not exceed 1 year.
 - iv. MBA in Marketing, software skills, social media management and content creation.
 - v. Strong communication skills, interpersonal skills, ability to work independently and in a team as their background with no backlogs.
 - vi. The first round in INK was each student was asked to send their own video resume.
 - vii. Subsequently, they were given a case study to analyse and present to the recruiters either in the college or office.
 - viii. To help the students in analysing the case study, Prof. Rajesh assigned two faculty to help them. The faculty are also the alumnus of the college. One of the faculty is part of the Alumni Association of the B-School. She contacted one of the Senior Alumnus (1995-97) who was in the industry from the last 30 years and sought his guidance on the placement from INK. He gave the necessary guidance. Only Deepak was picked up from the B-School with a pay package of Rs. 11lakh per annum.
4. Prof. Rajesh also remembered one instance where a studious student Bhanu Prakash with B-Tech background and with work experience in Marketing was picked up in campus placement for a meagre salary of Rs.1,20,000 per annum in 2004. The student didn't hesitate to join as the college provided limited placements and the industry also had limited openings. In 2022, the student became the President of the company. In

2021 September he addressed the students of MBA as an Alumnus and suggested them to not look for the pay package but to look whether the placement is providing enough opportunity to learn and grow. He is working in the same company for more than 20 years and the company gave him enough opportunity to learn, develop and grow.

5. From 2000 to 2004 it was really a challenge for both B-Schools and students to have a campus placement in the college as it was very hard to rope in companies as the industry didn't have many openings. Companies used to come to campus with very few job offerings and with very less pay package. Still students used to accept the job offer as it was much easier for them to get into a job through a campus placement than searching on their own for jobs. These days getting an off-campus placement is relatively easy with lot of job offers from industry and with the availability of many online job portals providing job offers.
6. Within a period of 10 to 15 years the college Alumni who studied around 2000 to 2005 and earlier have reached top notch positions in the industry. Though the job offers were very less, they had ample opportunity to learn and grow. To assess how prospective are the current placements to the current students one must wait for another 10 years to assess their growth and development.

Looking into these two instances, it is always a dilemma for students seeking placements whether to choose a company with high pay package or a company with low pay package and a high chance of learning, developing and growing. It would always be an ideal situation where there is an option of having both high pay package and a high chance to grow.

Not all students are confronted with such dilemmas but a student who is very studious and want to make the best of his career will always face such dilemmas. There are a good number of students who are only concerned with getting a placement and working on the job on a routine basis not really giving any weightage to such kind of dilemmas.

Prof. Rajesh was analysing as to what factors contributed to BDR B-School to have placements as their unique selling proposition:

1. Since inception of the B-School in 1987, the B-School has been focussing on placements. The intensity of placement activity was low and was unorganised. The most common feature between placements earlier and now is, there was a Placement Officer and Campus Recruitment Training earlier also. As years passed by, the placement activity in the college became more organized. In the year 2008, the college has started a state-of-the-art Placement & Grooming Division (PGD) with a Placement Head, Placement Officer, Three Placement Coordinators and a Faculty Coordinator. The Placement Department networks continuously with the industry.

2. There is an Alumni Association in place with constant interaction and coordination. Alumni are invited to address students, invited as judges, guest speakers and there are Alumni Meetings and Meets on a regular basis. Many of the companies that have come for placements are manned by the B-School Alumni in top notch positions.
3. Occasionally, Alumni approaches the B-School (Alma mater) whenever there are one or two job offers without organising a full-fledged campus placement. Likewise, they even approach for internships.
4. The B-School exclusively conducts a two-month Campus Recruitment Training that starts in the MBA II Sem and ends in the MBA III sem. This training is outsourced. The students are rigorously trained on soft skills, software and the requirements of the industry.
5. The students are given a Pre-Placement talk either by the Faculty or Alumni specifically before the placement drive starts.
6. The Placement & Grooming Division even organises Mock Interviews with the help of Faculty.
7. The college completed 75 years of its existence in 2025 and is the most preferred college for MBA education. SGKBES has built its brand image in Commerce and Management Education over a period by providing quality education.

Current Placement Scenario in BDR:

Out of the entire MBA students 75 % are selected through campus placements. 10% are not placement. 15% don't opt for placements as they have family business. Companies are generally considering 60% academic record starting from 10th to PG in the student's academic journey. The student shouldn't have any backlogs in MBA. The first round is a written test. The second round may be a Group Discussion. Third round is an interview. The minimum pay package is Rs. 4 lakhs per annum, average Rs. 5 lakhs per annum and the maximum is Rs.11 lakhs per annum.

Even few companies are picking up students as interns and later converting the internships into jobs and absorbing the students into the company. Generally, internships are for 1 to 3 months with pay ranging from Rs. 10,000 to Rs.25,000 per month.

Issues and Solutions:

BDR is a B-School with Placements as its Unique Selling Proposition (USP). It's not easy for a college to make placements as its USP. It takes a prolonged time to build a reputation for placements. It's not one such factor that contributes to such reputation. There are many factors that contribute to such kind of reputation. Some of them may be Promoters who value

Quality Education, Qualified Faculty, Good Infrastructure, Focus on Student Development, Industry Connect, Alumni Connect and many more explicit and implicit factors.

It's not only the effort of the B-School to provide quality education it is also the inclination of the student to grow and develop and make use the factors that attribute to his development. These two factors are mutually inclusive. The college may provide everything, but the student may not be inclined to make use of these factors. There may be instances where colleges are not concerned about providing a learning and resourceful environment, but the students are very good. For a college to have good placements not only the college should be good but also the attitude of the student should be good.

This case study emphasizes the need for colleges to provide quality education and a learning environment. At the same time, it also emphasizes the inclination and preparedness of students to make use of the learning resources of the college to develop and grow. B-Schools that foster learning environment and students who aim at self-development, would culminate into a good placement, which is a win-win situation for both the parties.

Conclusion:

These days one of the factors considered for admission in a B-School is placements. After a master's degree every student aspires for a placement as many students end up their education with a master's degree and want to settle in life with a placement. Not many B-Schools are equipped with placements. If a college is good at placements, the college need not strive hard for getting admissions and the vice-versa.

Teaching Notes:

Synopsis of the Case:

The case study, 'A Case Study on Campus Placements In A University Affiliated B-School' is developed by the Faculty of a B-School that has placements as its USP. How the college is reputed for its placements is being analysed by taking the example of a student who bagged the top Placement in the college in the history of the college. This case study also tries to understand what is considered as a good placement. This case study also highlights as to how a B-School evolves over time to have placements as its unique selling proposition. It is the conscious and concerted efforts of the college as well as the student that makes students bag campus placements. Precisely speaking, the collective efforts of college with various stake holders playing their part and the individual effort of the student will lead to bagging a placement.

Target Group:

This case study provides good insights to B-Schools and students as to how placements serve the best interests of the college and the students. This case study makes B-Schools and students to introspect on their objectives, goals and priorities. This case study will be very useful to B-Schools and Management students.

Learning Objectives and Key Issues:

1. What is the importance of providing placements by a B-School?
2. What factors contribute to providing placements in a B-School?
3. What factors are to be considered while joining a B-School?
4. How should the students equip themselves to get placements in general and best placements in particular?
5. Some placements don't provide good salary but provide an opportunity to learn and grow. Should the student select such kind of placement.
6. What is a good placement for the B-School and the student?

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