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aWeshkar

A Peer Reviewed Research Journal

Prin. L. N. Welingkar Institute of Management Development & Research

Vol. 32 Issue I
March 2025

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EDITORIAL

The academic landscape is in constant flux, shaped by evolving standards and shifting priorities. Recently, the removal of the UGC-CARE list of journals has sent ripples through the Indian research community, prompting critical discussions about quality, credibility, and the future of scholarly publishing. This demands further analysis on the multifaceted impact of this significant policy change, offering insights into its implications for researchers, institutions, and the broader knowledge ecosystem.

The UGC-CARE list, established to promote high-quality research and curb predatory publishing practices, served as a crucial benchmark for academic evaluation. Its removal, while intended to streamline processes and foster inclusivity, has raised concerns about the potential dilution of research standards. Researchers now face the challenge of navigating a vast, often unregulated pool of journals, demanding heightened vigilance and critical appraisal.

We must now examine the potential benefits of a more open and flexible publishing environment, while also acknowledging the risks of increased vulnerability to predatory journals. This examination includes the importance of robust peer review processes, the role of ethical guidelines, and the necessity of fostering a culture of academic rigor.

Furthermore, we consider the impact on early-career researchers, who rely heavily on established benchmarks for career progression. The removal of a definitive list necessitates a more nuanced approach to evaluating research output, one that emphasizes the quality and impact of scholarly work rather than solely relying on journal listings. aWeshkar aims to contribute to this ongoing dialogue, providing a platform for critical analysis and constructive solutions.

As we navigate this evolving landscape, WeSchool remains committed to fostering a culture of academic excellence and ethical research. We believe that aWeshkar plays a vital role in facilitating informed discussions and promoting scholarly inquiry. We hope this edition provides valuable insights and encourages thoughtful reflection on key areas of business management.

Prof. (Dr.) Uday Salunkhe
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- Findings (mandatory)
- Research limitations/implications (if applicable)
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References

References to other publications must be in APA style and carefully checked for completeness, accuracy and consistency. This is very important in an electronic environment because it enables your readers to exploit the Reference Linking facility on the database and link back to the works you have cited through CrossRef.

You should cite publications in the text: (Adams, 2006) using the first named author’s name or (Adams and Brown, 2006) citing both names of two, or (Adams et al., 2006), when there are three or more authors. At the end of the paper a reference list in alphabetical order should be supplied:

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2. **ABSTRACT**
3. **INTRODUCTION**
4. **LITERATURE REVIEW**
5. **METHODOLOGY:** including sampling, measurements, and scaling, quantitative (or/and) quantitative methods and incorporation of the same to the topic.
6. **ANALYSIS AND RESULTS:** the findings of the study
7. **DISCUSSION:** the reasoning for your findings with relevant theoretical support
8. **LIMITATIONS:** what the study could not take into account
9. **FUTURE SCOPE OF RESEARCH:** scope of improvement
10. **BIBLIOGRAPHY**

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A COMPARATIVE ANALYSIS OF TAXATION POLICIES AND HEALTHCARE EXPENDITURE: INSIGHTS FROM INDIA AND THE UK

Varsha R & Dr. Ratchana Rajendran*

Abstract

This research paper undertakes to explore the intricacies involved in healthcare expenditures and related taxation policies of India and the United Kingdom, two distinct nations in terms of their socio-economic settings. The primary focus of the research is to quantitatively and theoretically analyse UK taxation and Indian taxation policies related to medical expense deductions, variations in health spending patterns based on per capita income and medical deductions over a 10-year time frame, by employing multivariate regression, the paper aims to elucidate on the same. Furthermore, health expenditure trends from 2024 to 2030 have been forecasted using least square regression. Moreover, the paper theoretically analyses the distinctions and similarities in terms of medical deductions under taxes in both countries, thus enabling one to gain a comprehensive insight into this dynamic domain shaped by efficiencies, administrative complexities, long-term sustainability, affordability, accessibility and finance.

Keywords : *Taxation, healthcare expenditure, India, the United Kingdom (UK), medical deductions*

Introduction

“Taxation is a term for when a taxing authority, usually a government, levies or imposes a financial obligation on its citizens or residents. Paying taxes to governments or officials has been a mainstay of civilization since ancient times.”¹ Taxes are a compulsory contribution made by the public to the Government, to enable the Government to make public welfare expenditures about the provision of education, healthcare, social infrastructures, etc. A vast multitude of taxes exist, the prominent ones being income tax, goods and services tax, corporate tax and property tax.

There is no doubt that taxation policies framed by the Government in relation to the healthcare sector play a profound role in influencing the aforementioned industry. However, the quantum and degree of impact would vary on a year-to-year basis depending on the changes made

to a country’s fiscal policy. This research work endeavours to delve into the intricacies involved in the dynamic landscapes of healthcare expenditure and taxation, along with examining how one impacts the other.

The nexus between taxation policies and India’s & the UK’s healthcare spending patterns, respectively, are explored using a theoretical baseline in order to encapture crucial factors shaping both domains. Moreover, eligibility criteria, scope and other implications of taxes in the ever-evolving healthcare sector are analysed in each of India’s and the UK’s unique socio-economic landscapes. The Income Tax Act, 2007 delineates medical deductions from the purview of tax in the UK, while the Income Tax Act, 1961 encompasses medical deductions and related provisions in its ambit.

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Significance of research:

The research conducted in this paper sheds light on the way healthcare expenditure is impacted by taxation by employing quantitative and comprehensive theoretical research methods spanning over a time frame of 10 years. Two distinct economies are compared in this research. The primary point of the crucial distinction from this research's purview is the UK's tax-funded healthcare system – the National Health Service, abbreviated as the NHS. In contrast, India's approach to healthcare is a mixture of public-private healthcare systems. The research further aims to examine the similarities and distinctions involved between the countries, analyse the degree and magnitude of quantitative implications of per capita income and medical deductions available on health expenditures (as a % of GDP), along with forecasting trends in health expenditures in both countries till 2030, thereby drawing quantitative and qualitative conclusions based on the analysis made, pertaining to how the existing scenario can be improved to enable the residents of the countries to reduce their tax burden while medical expenses have already been incurred, along with explaining how the countries leverage their systems' eminence.

Research Questions:

1. How do taxation policies in India and the UK influence healthcare spending from the purview of medical expense deductions?
2. Do medical deductions exist in India and the UK? If yes, what are the laws pertaining to the same?
3. How are India's and UK's healthcare expenditures predicted to change as per past trends?
4. What similarities exist between India and the UK in terms of eligibility criteria, types of medical expenses covered, income thresholds and limitations, for medical expense deductions?
5. What differences exist between India and the UK in terms of eligibility criteria, types of medical expenses covered, income

thresholds and limitations, for medical expense deductions?

6. To what extent do per capita income and medical deductions influence health expenditures in India and the UK, as a percentage of GDP?

Review of Literature:

(Mahdi Kooshkebaghi, 2022) In the backdrop of tax being one of the most pivotal aspects of government spending used to provide public services, this research paper employs a qualitative research design by collecting primary data to explore specific taxes, green taxes, value-added taxes and other main themes to draw conclusions on such taxes' objectives and effects, hence throwing light its effects on the healthcare sector and into a vast multitude of domains regarding taxation and the Government's public spending.

(Rambhad, 2023) By conducting a systematic literature review including various government databases, websites, etc., pertaining to healthcare funding, health insurance schemes, healthcare budget allocations, categories of medical expenses, government policies, and health technology assessment (HTA) in India, the authors of this paper aim to delineate the past and present healthcare scenarios including healthcare policies, health insurance, etc. in India. The paper suggests that augmenting AI and ML in the medical sector, along with numerous other measures can improve equity and access in the healthcare sector of India.

(Mr. Nishant Ravindra Ghuge, 2016) The given research paper undertakes to perform a comparative analysis of India and 4 other countries in terms of their tax structures, tax-to-GDP ratio, Tax rates, Time Required for Tax Compliance, No of Tax Payments, Ease of Tax Payments, Ease of Doing Business etc. The paper concludes that India has much scope for improvement in being at par based on the above parameters, with other economies.

(Andreia Costa Santos, 2022) The paper suggests that by taking taxation imposed on alcohol and tobacco to improve public health, taxation could also be used to curtail other unhealthy behaviours such as increased use of cars, and so on to enhance societal well-being. Furthermore, the paper also suggests that such taxes could be imposed by the local Governments in their jurisdictions by collaborating with the Federal Government, on air pollution, land use and many more.

(David Mccoy, 2016) In this research paper, the authors aim to implement the conceptual framework of the 5 R's to elucidate the significance of tax in health improvement. The 5 R's include representation (aligned with democratic accountability), revenue stream, redistribution, re-pricing and regulation. The paper also intricately explores the challenges faced while implementing the same and highlights it to be shadow economies, trade liberalisation, weak tax administrations and so on. The paper concludes by stating that a greater awareness about the same could foster such an environment.

(Albadrani, 2022) This study focuses on identifying the impoverishing effects of out-of-pocket health expenditures in India, which is one of the highest in the world by estimating poverty gaps, household poverty levels and OOP healthcare expenses through the employment of logistic regression. The paper suggests that to combat such a tumultuous scenario, health insurance should be expanded, especially for those who live below the poverty line.

(Bhageerathy Reshmi, 2021) By employing a systematic review of literature, the paper aims to delineate the challenges faced because of healthcare inequities and inequalities and provide suggestions to overcome the same in terms of increasing accessibility and affordability. The main domain of information pertains to the impact of public-funded health insurance. It concludes that though numerous state and central PFHIs

are available to increase healthcare utilisation, there is no significant evidence to prove that there is a reduction in financial risk protection of the beneficiaries.

(Jacob, 2023) This research work aims to provide a comprehensive insight into the healthcare systems of the US and the UK in terms of healthcare system performance rankings measured by equity, healthcare outcomes, access to care, care process and administrative efficiency, along with which, it explores rates of preventable mortality.

(Princy Joseph, 2022) Especially in the post-COVID-19 era, healthcare prices seem to have accelerated. This research paper examines the effect of GST on the costs of products and services in the healthcare sector of India, by quantitative analysis of correlation, Friedman Test, Manova through the employment of SPSS software. The results may contribute towards Government policy formulation.

(Deepak Kumar Behera, 2022) By conducting a descriptive analysis and hypothetical regression, this research paper suggests “(1) raising domestic revenue mobilization, (2) generating alternative revenue collection mechanisms, (3) prioritizing health through expenditure management and (4) effective utilization of central transfer” such as higher excise duty imposed on tobacco and so on, can be utilised as revenue streams for fiscal spaces pertaining to health.”

Problem Statement :

Comprehension of medical deduction-related income tax laws in both countries, along with identification of congruencies and distinctions, forecasting health expenditure trends and analysing the quantitative implications of per capita income and medical deductions on health expenditures as a percentage of GDP, would enhance help in drafting optimised policy suggestions concerning healthcare policy framework and taxation-based financial support

mechanisms that would open up avenues for harmonisation in terms of fostering an enhanced healthcare affordability and accessibility in each of these countries.

Objectives:

1. To quantitatively analyse healthcare expenditure trends in India and theoretically analyse the medical expense deductions within the Indian tax framework.
2. To quantitatively analyse healthcare expenditure trends in the UK and theoretically analyse the medical expense deductions within the UK tax framework.
3. To examine the main differences and similarities in the eligibility criteria for medical expense deductions between India and the UK.
4. To analyse the degree and magnitude of the impact of per capita income and medical deductions in India and the UK on their health expenditures over a 10-year time frame.

Research Methodology

Delimitation of study:

- ◆ This study is limited to secondary data collected from internet sources, such as the World Bank, OECD, and so on, pertaining to India's and the UK's macroeconomic indicators. The collected data has been analysed using quantitative analysis methods encompassing multivariate linear regression, least squares regression, hypothesis testing, graphical analysis, and theoretical analysis.
- ◆ *Time frame* :
 - I. Least square regression – FY2014-FY2023 (10 years) for both India and the UK
 - II. Multivariate linear regression :
 - a. India: 2011-2020 (10 years)
 - b. The United Kingdom: 2012-2021 (10 years)

- ◆ This study is also limited to the countries of India and the UK and selected variables of per capita income, health expenditures as a % of GDP, medical deductions and laws pertaining to the same.
- ◆ *Linear regression*: This research employs multivariate linear regression wherein Health expenses as a % of GDP is the independent variable and per capita income and medical deductions are the dependent variables. This is conducted separately for each of the countries.
- ◆ *Least squares regression*: This statistical tool aims to derive the line of best fit which “minimizes the sum of squared differences between the observed data points and the predicted values” and forecast values. The variable that is being forecasted based on past data is health expenditure in India and the UK, separately.
- ◆ *Graphical analysis*: In this research work, bar graphs have been used to enhance data interpretation and drawing of subsequent inferences.
- ◆ *Theoretical analysis*: A qualitative theoretical analysis of tax laws pertaining to medical deductions based on the socio-economic scenarios of both India and the UK has been undertaken in this study.

Data Collection and Source: Secondary data from reliable websites as mentioned in the references section was obtained from internet sources based on relevancy, availability and requirement.

Hypothesis statements :

1. H_{1_0} : Per capita income and medical deductions do not significantly influence % of health expenses in the GDP of India.

H_{1_1} : Per capita income and medical deductions significantly influence % of health expenses in the GDP of India.

2. H_{2_0} : Per capita income and medical deductions do not significantly influence % of health expenses in the GDP of the UK.

H2₁: Per capita income and medical deductions significantly influence % of health expenses in the GDP of the UK.

The above hypothesis statements are tested in Objective 4.

Data Presentation :

1. Country : India

Time period of forecast : 2024-2030

Time period of analysis : 2014-2023 (10 years)

Analysis technique : Least square regression

Year	Total healthcare expenditure (in billion USD) (y)	x = t – 2018.5	x ²	xy
FY2014	73.82	-4.5	20.25	-332.17
FY2015	75.73	-3.5	12.25	-265.05
FY2016	80.32	-2.5	6.25	-200.80
FY2017	77.95	-1.5	2.25	-116.93
FY2018	77.30	-0.5	0.25	-38.65
FY2019	83.37	0.5	0.25	41.68
FY2020	79.08	1.5	2.25	118.62
FY2021	93.56	2.5	6.25	233.91
FY2022	100.00	3.5	12.25	349.99
FY2023	108.98	4.5	20.25	490.41
Sum =	850.11	0	82.5	281.01

Table 1.1

a (constant) = 85.010758

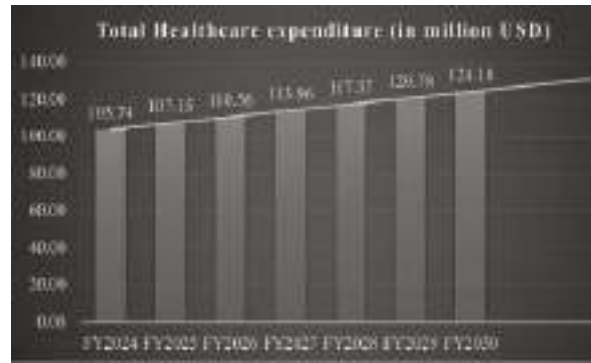
b (gradient) = 3.406161091

Line of best fit : y = a + bx

Total healthcare expenditure (in billion USD) = \$85.01 billion + 3.41 (financial year under consideration)

Year	Values (y) (in billion USD)
FY2024	103.74
FY2025	107.15
FY2026	110.56
FY2027	113.96
FY2028	117.37
FY2029	120.78
FY2030	124.18

Table 1.2



Graph 1.1

Medical deductions under Income Tax Act, 1961 :

Laws: Section 80D and 80DDB of the Income Tax Act, 1961.

i. Section 80D: Pertains to deductions available for medical insurance premiums paid by the tax assessee during the tax year.

Eligibility criteria: Can be claimed by individuals (themselves, their spouses, dependent children and parents) and HUF upon having paid medical insurance premiums or incurred medical expenses for uninsured dependents and upon producing the proof for the same.

Deductible expenses: Preventive health checkups (including cash payments), contributions to the Central Government Health Scheme, and medical expenses incurred for senior citizens who do not have health insurance.

Limit for deduction: Varies from year to year (discussed below)

2013-2014: In this tax year, deductions were available for medical insurance payments made for self and immediate family members, with the maximum limit being Rs. 15,000 for self, spouse and children and an additional Rs. 15,000 being available for parents.

2014-15 till 2018-19 no significant changes were made to the then-existing provisions.

2019-20: The above-mentioned maximum deduction threshold was increased to Rs. 25,000 for self, spouse and children along with Rs. 25,000 for parents. In case the parents are senior citizens, the deduction threshold was increased to Rs. 50,000.

2020-21 & 2021-22 witnessed no major alterations in the deduction limits.

2022-23: The above provisions continued, except the threshold limit increase to Rs. 1 lakh if both parents are senior citizens.

ii. Section 80DD: This section pertains to “expenses incurred for the medical treatment of specified diseases”

Eligibility criteria: Can be claimed by individuals (themselves, their spouses, dependent children and parents) and HUF upon having incurred expenses pertaining to the treatment of a specified disease (list provided in the Act) and on obtaining a certificate from a medical specialist who fulfils the criteria laid down by the income tax authorities.

Limit for deduction :

2014: A maximum deduction of Rs. 40,000 or actual medical expenses incurred (whichever was less) was allowed.

2014-15 till 2018-19 no significant changes were made to the then-existing provisions.

2019-2020: The previous provision prevailed for individuals below 60 years. However, for senior citizens, the deduction was increased to Rs. 1,00,000 per year.

2020-21 & 2022-23 witnessed no major alterations in the deduction limits, with the previously existing provisions still prevailing.

Note 1: Along with the above, employer-reimbursed medical expenses are also exempt from tax.

Note 2: In this research Sections 80D and 80DDB are encompassed to enhance further detailed

research and specificity. However, there are other provisions such as 80C and 80DD that also pertain to medical deductions to a certain extent.

2. Country : The United Kingdom

Time period of forecast : 2024-2030

Time period of analysis : 2014-2023 (10 years)

Analysis technique : Least square regression

Year	Total healthcare expenditure (in billion GBP)	x = t - 2018.5	x ²	xy
FY2014	175.96	-4.5	20.25	-791.82
FY2015	183.72	-3.5	12.25	-643.02
FY2016	188.21	-2.5	6.25	-470.53
FY2017	194.53	-1.5	2.25	-291.8
FY2018	200.07	-0.5	0.25	-100.04
FY2019	209.93	0.5	0.25	104.965
FY2020	222.89	1.5	2.25	334.335
FY2021	256.5	2.5	6.25	641.25
FY2022	280.71	3.5	12.25	982.485
FY2023	282.62	4.5	20.25	1271.79
Sum =	2195.14	0	82.5	1037.63

Table 2.1

a (constant) = 219.514
b (gradient) = 12.57733

Line of best fit :

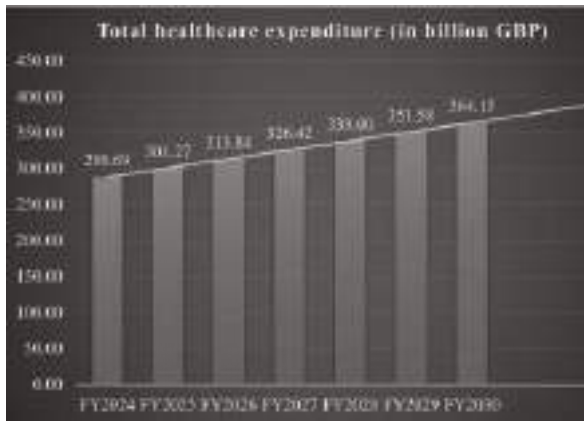
$$y = a + bx$$

Total healthcare expenditure (in billion GBP) = 219.514 billion GBP + 12.58 (financial year under consideration)

Forecast :

Year	Values (y) (in billion GBP)
FY2024	288.69
FY2025	301.27
FY2026	313.84
FY2027	326.42
FY2028	339.00
FY2029	351.58
FY2030	364.15

Table 2.2



Graph 2.1

The treatment of medical expense deductions is distinct in the UK, considering the National Health Service, a Government-owned, comprehensive healthcare system that provides free medical services to patients without direct charges at the time of service, as it is funded through general taxation (sometimes, nominal charges may be imposed. For example prescription charges).

Some health benefits provided by employers to their employees are tax-free, such as yearly check-ups, eye tests, etc.

However, private health insurance premiums paid by individuals are not tax deductible in the United Kingdom.

Since the tax year 2014-2015, the threshold limit for deductions has remained to be 7.5% of Adjusted Gross income till 2022-23. Other provisions mentioned above have prevailed as well.

Due to National Health Service’s free medical services, Government financed healthcare expenditure in the United Kingdom is 79% of the total healthcare spending in the country and it occupies a significant proportion in the Gross Domestic Product of the country, as well.

3. The differences and similarities prevailing in India’s and the UK’s taxation system with particular reference to medical deductions are examined in the next section

4. i. Country : India ,
Time period of analysis : 2011-2020 (10 years)
Analysis technique : Multivariate linear regression
Dependant variable : Current health expenses as a % of GDP of India
Independent variables : Per capita income and medical deductions in India

Year	Per Capita Income (in Rs. (decimals))	Medical deductions (maximum) (in Rs. (decimals))	Current health expenses as a % of GDP (in decimals)
2011	63462	40000	0.0325
2012	65538	40000	0.0333
2013	68572	40000	0.0375
2014	72805	40000	0.0362
2015	77659	40000	0.0360
2016	83003	40000	0.0350
2017	87586	40000	0.0294
2018	92241	40000	0.0286
2019	92241	40000	0.0294
2020	86659	40000	0.0296

Table 4.1.1

Model Fit Measures				
Model	R		R ²	
1	0.699		0.489	

Table 4.1.2

Model Coefficients - Current health exp % of GDP				
Predictor	Estimate	SE	t	p
Intercept	0.0510	0.00725	7.040	<.001
Per Capita Income (in Rs.)	-1.94e-7	8.53e-8	-2.276	0.057
Medical deductions (maximum)	-1.84e-7	2.94e-7	-0.627	0.551

Table 4.1.3

- ◆ Since the majority of the population in India falls under 60 years old, the medical deductions available for senior citizens up to 1 lakh, have not been included in this analysis, to ensure singularity and uniformity in the variable's data set.

ii. Country : The United Kingdom

Time period of analysis : 2012-2021 (10 years)

Analysis technique : Multivariate linear regression

Dependant variable : Current health expenses as a % of GDP of the UK

Independent variables : Per capita income and medical deductions in the UK

Year	Per Capita Income (in GBP (decimals))	Medical deductions (maximum) (in decimals)	Current health expenses as a % of GDP (in decimals)
2012	30,284	0.075	0.0993
2013	30,634	0.075	0.0984
2014	31,372	0.075	0.0983
2015	31,816	0.075	0.0975
2016	32,162	0.075	0.0970
2017	32,820	0.075	0.0959
2018	33,082	0.075	0.0966
2019	33,443	0.075	0.0987
2020	29,852	0.075	0.1198
2021	32,468	0.075	0.1194

Table 4.2.1

- ◆ Medical deduction as a % of Adjusted Gross Income and current health expenditure as a % of GDP are both available as percentages. Hence, to standardise it with per capita income which is available in number format, the 2 variables have been changed to decimal form, to facilitate the regression analysis.

Model Fit Measures			
Model	R	R ²	
1	0.327	0.107	

Table 4.2.2

Model Coefficients - Current health expenses as a % of GDP					
Predictor	Estimate	SE	t	p	
Intercept	0.181	0.0803	2.251	0.055	
Per Capita Income (in GBP)	-2.47e-6	2.52e-6	-0.980	0.356	
Medical deductions (maximum)	NaN	NaN	NaN	NaN	

Note. Linear model contains aliased coefficients (singular fit)

Table 4.2.3

Note 3 : All the charts, graphs and analysis outputs displayed above are the author's work using MS Excel Software and Jamovi Software.

Note 4 : The most recent time frames have been chosen for each of the above analyses based on the availability, reliability and relevance of data, however, the tenure of the time frame is a constant of 10 years.

Data Analysis And Findings

Objectives 1 and 2 :

Research questions being answered with the analysis for objectives 1 and 2:

1. How do taxation policies in India and the UK influence healthcare spending from the purview of medical expense deductions?
2. Do medical deductions exist in India and the UK? If yes, what are the laws pertaining to the same?
3. How are India's and UK's healthcare expenditures predicted to change as per past trends?

As can be analysed from the data presentation section of this paper,

Table 1.1 and **Table 2.1** show the past trends in health expenditure incurred over a time period of 10 years in India and the UK respectively, while **Tables 1.2** and **2.2** depict the forecast of medical health expenditures of both the countries till FY2030. The direction and quantum of the change can be gauged graphically from **Graph 1.1** and **Graph 2.1**.

Despite the vast differences existing in terms of healthcare provision, healthcare funding, and related tax deductions available in both countries, it is observed that health expenditures are increasing at a steady pace till FY2030 and beyond. However, the rate of increase is differing with the gradient being 3.41 for India and 12.58 for the UK. Such differences may arise from varying economic (GDP, currency value, inflation, Balance of Trade, Balance of Payments, GNP, NNP, NDP, etc), demographic, geographic and social landscapes in India and the UK.

This may also be because of increased health awareness among people, due to which preventive health checkups are undertaken more frequently, inflation or it could be due to the increased costs (recurring, allocated, sunk, etc. in nature) in terms of operating expenses, heavy investment in infrastructural facilities such as labs, technology, and so on, in hospitals, etc. in the medical sector that have led to increased prices, especially in the post-COVID-19 era.

Objective 3 :

1. What differences exist between India and the UK in terms of eligibility criteria, types of medical expenses covered, income thresholds and limitations, for medical expense deductions?

Differences :

- ◆ Medical insurance premiums : In India, health insurance premiums are tax-deductible under Section 80D, whereas in the UK, it is not a deductible expense. However, tax relief is provided if individuals contribute towards private health insurance plans.
- ◆ Medical expense reimbursements received by employees from employers: Reimbursements of medical expenses received by employees from the employer up to Rs. 15,000 is tax-free, in India. Whereas, in the UK, medical reimbursements received are not taxable at all.

- ◆ Medical allowances provided to Government employees: No medical allowance is provided to Government employees in the UK, while in India it is fixed and is partially taxable.
- ◆ Medical treatment received abroad: Medical treatment received by a resident abroad is tax-deductible on the fulfilment of certain conditions in India, while in the UK, it is not tax-deductible.
- ◆ Medical expenses incurred for senior citizens: In India, medical expenses incurred pertaining to senior citizens are tax-deductible under Sections 80D and 80DDB of the Income Tax Act, 1961. However, in the UK, such expenses are not tax deductible, rather they receive extra allowances for medical expenses.
- ◆ Preventive health checkups: No tax deductions are available in the UK when it comes to paid preventive health checkups, whereas it is allowed in India.

The reason for the non-allowance of deductibility for such medical expenditures may be to encourage residents to use the medical services of the National Health Service in the UK. Since, in India, it is a mixture of private and public sectors in the medical sector, a vast multitude of deductions are available to reduce the tax burden on residents.

2. What similarities exist between India and the UK in terms of eligibility criteria, types of medical expenses covered, income thresholds and limitations, for medical expense deductions?

Similarities :

- ◆ Tax relief for expenses incurred for disabled dependants: In the UK and India, tax relief is provided for such expenses incurred for medical care offered to disabled dependants.
- ◆ The existence of fewer similarities may yet again be attributed to demography, economic settings, government policies

and tax legislations that are unique to each of the two countries.

It can thus be said that both countries promote health monitoring through tax incentives, as in the case of India and free-of-cost, tax-funded medical services in the case of the UK. The overall motive for this is regarded as the fostering of a healthy nation by alleviating medical expense burden, providing financial support for the elderly, encouraging preventive health checkups and encouraging contributions towards medical insurance.

Objective 4 :

1. To what extent do per capita income and medical deductions influence health expenditures in India and the UK, as a percentage of GDP?

i. Table 4.1.1 depicts India's temporal data pertaining to the variables under consideration. Tables 4.1.2 and 4.1.3 are the multivariate regression output generated. The correlation coefficient R stands at a positive value of 0.699 which indicates a moderately strong, positive correlation among per capita income, medical deductions and healthcare expenditure patterns.

R^2 stands at 0.489, implying that 48.9% of the variations in healthcare expenditures can be explained by changes in per capita income and medical deductions and can be regarded as a moderate explanatory power. Since the p-value of both per capita income is 0.057 and medical deductions are 0.551, it suggests that the data is consistent with the null hypothesis, at a confidence level of 95%.

Therefore, the null hypothesis (H_{10}) is not rejected: This implies that per capita income and medical deductions in India do not significantly affect healthcare expenditure's % in the country's GDP. However, the moderately strong, positive correlation may have been because of the availability of medical deductions at a level of Rs. 25,000 during the 10-year time frame.

ii. Table 4.2.1 depicts the UK's temporal data about the variables under consideration. Tables 4.2.2 and 4.2.3 are the multivariate regression output generated. The correlation coefficient R stands at a positive value of 0.327 which indicates a moderately weak, positive correlation among per capita income, medical deductions and healthcare expenditure patterns.

R_2^2 stands at 0.107, which implies that 10.7% of the variations occurring in healthcare expenditures can be explained by changes in per capita income and medical deductions and can be regarded as a very low explanatory power. The p-value of per capita income is 0.356, which suggests that the data is consistent with the null hypothesis, at a confidence level of 95%.

Therefore, the null hypothesis (H_{20}) is not rejected. This implies that per capita income and medical deductions in the UK do not significantly affect healthcare expenditure's % in the country's GDP. Moreover, the weak positive correlation between the variables may be because of the free healthcare services provided by the NHS in the UK which occupies a major proportion of medical health services in the country, thereby making the medical deductions that could be availed if paid health services affect health expenditure patterns less significantly.

Suggestions :

- ◆ In India and the UK, policy measures should be implemented to curtail inflation to manageable levels, thereby preventing healthcare costs from skyrocketing.
- ◆ Moreover, increased efficiencies can be ensured by optimising costs, mitigating risks and optimal financial planning at hospitals to keep costs under control, to ensure affordability of healthcare services.
- ◆ Resources should be allocated strategically to ensure the effective delivery of healthcare services since it is one of the most crucial sectors that directly cater to health.

- ◆ The government should formulate policies to cap medical charges levied on patients in India (since in the UK, the NHS provides free services or at nominal charges), to ensure that patients are not overcharged, especially in the private sector hospitals.
- ◆ Considering the vast multitude of medical deductions available in India, residents should be encouraged to take up preventive health checkups and claim tax deductions for medical expenses. This can be done by enhancing awareness among people about such deductions, which would enable them to not only availing tax deductions but also ensure their health status is maintained at an optimum level.
- ◆ Considering the increase in inflation, India should consider increasing the medical deduction limits as it has remained almost the same with low magnitude increases in the last 2 financial years. However, fiscal burden must be kept in mind while formulating such policies and these should be regularly reviewed.

Conclusion :

The differences existing between India and the United Kingdom in terms of medical deductions and other taxation policies find their foundation in fundamental aspects such as their social, economic, financial and legal landscapes. Medical expense deductions can be said to be the product of numerous factors such as administrative complexities, economic development, fairness, government policies (fiscal policies) and so on. Despite such differences, the ultimate aim has been to enhance affordability, efficiency and accessibility for people, in terms of healthcare, in both India and the UK.

Further scope for research can be suggested as a comparative analysis between other countries in the same regard, evaluation of the impact of medical deductions on fiscal burden, efficiency, and long-term sustainability, along with the same research in a different time frame, as an intra-country analysis.

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RESEARCH

“SCENIC, SERENE, SUBLIME” : DEVELOPING ODISHA AS A SUSTAINABLE DESTINATION BRAND THROUGH DIGITAL MARKETING INITIATIVES

Subrat Swain & Dr. Shwetasaibal Samanta Sahoo*

Abstract

The emergence of new tourism destinations and the intense competition in the global tourism industry have made it essential for sustainable destinations like Odisha to adopt innovative marketing strategies to stand out and gain a competitive edge.

One of the key trends in marketing tourism destinations is the use of social media. Social media platforms have gained prominence as cost-effective marketing tools with high returns. Odisha Tourism can leverage social media platforms such as Facebook, Instagram, and Twitter to reach a wider audience, engage with potential tourists, and promote its unique attractions and experiences. Using social media effectively, Odisha Tourism can create a strong brand identity and increase its visibility in the sustainable tourism market.

To understand the role of social media in developing Odisha as a sustainable destination brand, the researchers analysed the data available from the official websites of Odisha Tourism. This analysis helped in identifying the current usage of social media by Odisha Tourism and how it contributes to sustainable destination branding. Additionally, the researchers studied different digital marketing strategies employed by Odisha Tourism and analysed their effectiveness in attracting tourists. Each destination has its unique strategies to attract customers, and Odisha Tourism needs to assess and enhance its digital marketing strategies to influence its business positively.

The findings of this research paper will provide valuable insights for the Odisha tourism industry in designing and optimizing its websites and digital marketing strategies. By utilizing the findings and recommendations from this research, Odisha Tourism can effectively leverage social media and enhance its destination branding efforts to attract more tourists and boost its tourism industry.

Design/Methodology/Approach

Using a qualitative research technique, this study examines and evaluates literature that establishes a connection between branding strategy, social media, and destination promotion. This relates to the setup of case studies, articles, and industry reports to create a model that showcases the strategy and process of branding a region as a top tourist destination because of social media advertising methods. The qualitative method also includes surveys among the tourists and the travel brands and social media influencers to analyze the current trend of destination branding.

Findings

Based on the extensive literature review and the other qualitative methods the findings of the paper were noted down. The connection between the destination branding of a region and the social media branding techniques such as promotion through influencers and real-life user/tourist reviews of the place, is very strong. In the modern era of branding, social media plays a very crucial role.

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Keywords : *Sustainable Destination Branding, Odisha Tourism, Digital Marketing, Social Media initiatives, Destination Marketing*

Introduction:

The research topic, “Scenic, Serene, Sublime”: The research paper titled Social Media Tourism Promotion: A Destination Branding Study on Odisha, explores how and to what extent social media can become a marketing tool to establish Odisha as a world-class tourist spot. Odisha, lying on the eastern coastal line of India is the abode of cultural heritage, spiritual significance and geographical and biological diversity. Starting from the famous Kalinga Temple at Bhubaneswar and the pièce de resistance of Puri, Odisha is a treasure of unexplored experiences, be it the pristine beaches along the Bay of Bengal, the lush green forests, blooming waterfalls, wildlife sanctuaries and all sorts of adventurous sports.

Yet the state has tremendous opportunity, Odisha is still not well explored in the tourist map of the world. This study looks at how current digital marketing strategies, particularly social media, can assist in overcoming this situation and promote Odisha as a destination brand. From this we see that social media is a vast and audience-engaging method of relaying messages, hence making it the best place to transform and share sentimental stories that would make any destination stand out. studying how Odisha can present itself through Instagram, Facebook, Twitter or YouTube in terms of scenic beauty, serene environment followed by soul-soothing, sublime cultural experiences.

Innovative case analysis will be conducted concerning existing tourism promotional strategies integrated in social media platforms; The identified users’ engagement; the Influence of individuals involved in Microblogs, Photo sharing and Blogging sites over the perception regarding Odisha as a travel destination; & User-generated content. This research will use case studies of successful DB campaigns to evaluate the efficacy of visual imagery, and community content to dis-

cover best practices that can be used to build a robust presence for Odisha in the global tourism industry.

Background of the Study:

Emerging as an important strategy in the context of tourism marketing in the contemporary world, destination branding aims to set zones apart in a bid to pull visitors. Social media networks as widespread means of free communication with the network and user-generated content influence the promotion of various destinations. Destination branding is therefore a broader concept compared to usual marketing procedures because it seeks to design an image for a certain destination with regard to its culture, and natural and historical features appealing to prospective visitors. Admittedly, many states are competing for dominance in the fast-growing industry of India’s tourism, and, thus, according to market promotions and customer perceptions, Odisha as a destination brand, remains largely underexplored as an appealing travel destination that boasts prescient features such as stunning geographic and coastal topography and otherworldly archaeological and historical landmarks.

Odisha located on the eastern coast of India is blessed with nature’s beauty, tradition, and being spiritually important. In addition to the places of religious importance such as the temples of Bhubaneswar, the gamines of Puri, and the Chilka Lake known for its ecological features, Odisha does not attract a multitude of visitors as a destination does not have as much fame as Kerala or Rajasthan. This lack of visibility is something that can be partly explained by fragmented branding activities as well as low engagement of the contemporary Internet tools and resources for promotion.

Businesses such as Instagram, Facebook, and YouTube have helped the tourism business to

promote it self at low costs and to a broader population. They enable destinations to interact with domestic and International tourists and have live contact, review and sharing of experiences. An equally important role in inspiring and informing the decision of tourists is social media, which with a continuous rise in the ownership of smartphones and internet access.

Considering the increased usage of social media platforms especially in tourism promotion, there is an acute need to formulate and effectively operationalize branding promotion of Odisha out of numerous natural, cultural and historical attractions.

Literature Review :

Specifically, social media has recently attracted significant interest in the context of destination branding since it marked a shift in the way tourism branding is done. Volume has been given to research articles that sought to identify the impact of social media on tourists as well as their perception, behaviour, and travel decisions and how destinations can harness the social media platform to develop and communicate powerful destination brand images. In the context of promoting Odisha as a destination brand, the following key areas of research are relevant:

Destination Branding and Identity Creation :

Destination branding is a rational and purposeful act of business, directed at building a distinctive, easily recognizable image of a destination among consumers. As Kavartzis and Ashworth fundamentally explain, the branding of a typical destination involves the development and promotion of a credible image that is appropriate in the circumstances and comprehensible to the audience. Establishing the approval of a destination brand image has been underscored by research showing

that if there is incongruity between the image that a destination seeks to portray and that which is presented by its promotional campaign, the outcome is likely to be damaging (Anholt, 2010). When it comes to tourism promotions and positioning, Odisha holds cultural tourism and tourism in natural sites as its major strengths for tourism marketing, brand building is paramount for positioning the state as a unique destination to those offered in other parts of India. Morgan, Pritchard, and Pride (2011) argue that a destination should pursue distinct characteristics of appeal that make it special and engaging to visitors; therefore, Odisha should build its brand on "Scenic, Serene, Sublime" to create a memorable brand image.

Social Media as a Tool for Destination Promotion :

Interactive real-time media environments have become central to tourism marketing and communication, because social media sites enable destinations to directly engage with tourists. According to Hays, Page and Buhalis (2013) tourists get to see visuals and stories which are important in their perception of reality through social media. Social media tools such as Instagram, YouTube and Facebook allow destinations to build a library of images and videos with real, easy to replicate content. Concerning the effects of social media on decision-making, Kaplan and Haenlein (2010) along with other authors' works indicate the importance of word-of-mouth communication and relevant post in tourists' behaviour. In as much as these platforms may pose various challenges, utilizing them for Odisha would help lift the visibility of the state, creating a platform through which the state gains exposure locally and internationally in the most economical way. It has been realised that blending storytelling into social media campaigns increases users' engagement; a factor useful for marketing Odisha with its attractive geography and culture.

Contemporary tourism and tourist behaviour or tourist profile and social media involvement :

There is now evidence that tourist behaviour is being transformed by Web 2.0 technologies and is more and more shaped by online communication. Munar and Jacobsen (2014) P's highlight knowledge stating that social media has been increasingly used as a source of inspiration and information on travel. Previously, visitors only consume information and inactive receiving information, but now they co-create the destination's narrative through posts, reviews, and recommendations. This element of social media interactivity is therefore highly valuable for the purpose of selling destinations such as Odisha, as any content created and shared by users is far more likely to encourage other users to visit the region. A study carried out by Gretzel et al. (2007) reveals that embedding social media in Tourism destinations can impact tourists' participation and choice in a very special way. As for the Odisha example, there are some circumstances under which the usage of social media for building an active community of engaged users can enhance understanding of the destination and the level of communication between the DMO and the target audience.

Challenges and Opportunities in Promoting Emerging Destinations :

Emerging destinations like Odisha face significant challenges in the competitive tourism marketplace. . Pike (2017) reveals that WIA has recognized that while it may help to have prior demand and/or established brand equity you do not start in the top ranks of established competitor destinations, thus Player Two is more likely to have to spend seriously to create demand in new country areas. Social networking has been established to be an efficient strategy because it eliminates the above-mentioned difficulties associated with conventional advertisements for emerging destinations. However, Buhalis and Law (2008) rightly point out that there is an urgent need for better planning and focus so that SM strategies

are well-directed and effective. Adaptable content is a huge plus and opportunity for Odisha because adventure tourists, spiritual tourists, and even Eco-tourists are out there around the globe. It has been found that through the appropriate, single-purpose, data-driven promotion of social media, emerging tourism destinations may establish themselves more favourably by creating an appealing, individualised story (Morrison, 2013). This paper aims at the entrepreneurship approach, identifying Odisha's strengths in branding attractiveness and difference in the tourism market by calling for attention to its aesthetical natural endowment, peaceful environment, and spiritual history.

Methodology :

This research, titled *"Scenic, Serene, Sublime: The study "Odisha Social Media Initiatives and its Impact on Travel and Tourism,"* exclusively uses a qualitative, descriptive method to understand the role of social media in the formation of the state's travel destination branding. To capture this influence, face-to-face interviews and self-administered questionnaires will be administered among travellers, non-travellers intending to visit the destination and key informant professionals in the tourism sector. Further, Communication is going to be utilised to assess the impact of branding strategies from the content analysis of the social sites. Descriptive and inferential analytical techniques will be adopted in this study based on previous studies on tourism branding and social media marketing for the promotion of Odisha tourism as a peaceful and attractive tourist destination.

Discussion and Findings:

Impact of Visual Content on Destination Perception

Visual content is a powerful tool in destination branding and the research findings for "Scenic, Serene, Sublime: From the papers titled "Social Media Strategies for Promoting Odisha as

a Destination Brand” the importance of this factor in influencing the perceptions of the travellers towards the Odisha is evident. It also concluded that learning applications including Instagram, Facebook, and YouTube, which are more oriented towards visuals, were found highly useful in popularizing the cultural and tourist attractions in Odisha, the natural beauty of the state and its niche tourism products. The promising audience and travel intentions together with observed stimuli such as photos and videos were perceived as critical visual cues.

The serene beaches: Puri, the supreme architecture of temples like Konark Sun Temple, the brilliant views located in areas like Chilika lake and Eastern Ghats were the vivid topic spotting nice stability in the face of the most frequently shared and interacted with images. Although India is the home diverse geographic all and scrapes, the most stunning examples of the architectural installations can be found in the Such visuals were much helpful to the viewers since they allowed them to give a virtual experience of Odisha before they could visit the area. Interview respondents mentioned that pictures and videos of beautiful places in Odisha convey emotions, inspiring people to choose Odisha for their next vacations more likely.

Furthermore, this research revealed that distinct visual content that includes some festivals in Odisha like the Rath Yatra and the Konark Dance Festival, giving off a cultural curiosity of those interested in the natural environment and other forms of aesthetics in addition to culture boosted travelers’ interest in the state. Images of art, craft and tribal tourism were also contributed to travelers looking for uniqueness and unexplored destinations.

Overall, it was possible to notice the effects of the concept of visual literacy in the number of engagements these posts created. Readers and twitter users tended to engage with posts with beautiful photography or good footage in the video or gifs, for instance, likes or retweeting and commenting.

which in turn helped in increasing brand awareness of Odisha on social media handles, making it an organic approach. The study also found out that posts containing short clips that are easy on the eyes such as reels, stories had a better engagement than posts containing lengthy information, which also agrees with previous findings that social media has become more visually oriented.

Yet quality was a primary determinant of prognostication in relation to perceive visual content. It also noted that increased consumer engagement – and recalled brands specifically – rewarded high-definition images and professionally captured videos, as well as creative edits. Conversely, low quality content generated almost no response, further proving that professionally produced media content must be incorporated into Odisha’s destination branding.

Hence, visually led content is central to effective social media marketing for Odisha, which goes into building and reminding the audiences about the brand promise of ‘Odisha Open.’

Consumption impact on the perception of travelers :

Another conclusion of the research is that social media initiatives augmented the perception about travelling to Odisha. Currently, channels like Instagram, Face book, twitter and YouTube are the main ways in which the impression of potential travelers is created in order to influence their decision making. For Odisha, often considered as a state of low tourist appeal and identified more as a less popular, offbeat place, these platforms have surely come as a blessing as it has provided a method of expression through visual communication of its attractions.

With the help of the given social media promotions and the pictures and videos shared by tourists, the perception of Odisha as a culturally dense and calm state has been further enhanced. A new finding of this research is that travelers who were attracted to Odisha through social media are

more likely to perceive the state in the way Odisha Tourism wants it, as a “Scenic, Serene, Sublime” destination. This change of attitude is marked most profoundly on the generation of youngsters who are likely to depend on electronic information systems in their quest for travel destinations. Eye catchy pictures of Jagannath Temple, beaches like Puri & Chandrabhaga, wonderful scenery of Chilika Lake & the Eastern Ghats helped in making a high recall value for the state branding.

The study also revealed that through social media, potential tourists came across characteristics of the state that conventional touting did not capture. Most of the respondents mentioned that initially, they did not pay much attention to Odisha as a tourist destination, but they were encouraged after seeing beautiful pictures and videos, inspirational blogs, and other interesting posts, stories, or recommendations of tourists or the influencers. This shows how social media has made the world realize the importance of creating awareness and changing the image of a destination through the assurance of a serene, cultured and scenic view.

Yet, the study found that while the above unfolded, social media was not only restricted to awareness generation. Travelers have been able to share their experiences and recommendations through social media as a way of establishing the much-needed social closeness during the summer holidays. Such word-of-mouth communication has greatly helped to popularize Odisha as a tourist destination, since people trust recommendations from people in their network than highly priced adverts.

Through vast usage of social media, the thought transforming process of Odisha from a underestimated state for traveling to a place which provides a majestic and calm traveling experience in terms of culture, nature, and beauty has been primarily achieved.

User generated content and authenticity :

The role of UGC in formation of the destination image is one of the most significant trends within the contemporary tourism promotion strategies

and especially social media. In the context of developing Odisha as a destination brand adoption of the catch line “Odisha: Scenic, Serene, Sublime”, UGC helped to build the genuine appeal and to complement the overall credibility of the destination promotion. This study established that, in the quest to help potential travelers change their perceptions towards a particular travel destination, UGC is key with photo and video clips, and stories from other visitors being critical elements.

Additionally, announcing this content in official travel blog is effective as it provides a real and raw approach to the destinations. While ‘advertisements’ crafted in cooperation with destination marketing organizations for advertising purposes can sometimes be ‘too perfect’, UGC is authentic. Young people who actively share their travelling experiences with Odisha on sites such as Instagram, Facebook, or travel blogs or travel blogs create authentic message conveying real life stories of their interaction with Odisha landscapes, cultural heritages and people. This makes it easy for potential visitors to develop a more credible association with the destination because they can see the trip from the perspective of others.

Also, UGC acts as social proof where a person would be compelled to experience a given destination or use a particular item if they see others were willing to. Let me illustrate this with the Odisha example; when people visit Puri, Bhubaneswar or Chilika Lake to have peace in their beaches, spiritualism in the temples or eye-feast in their boats respectively, the satisfaction stories turn into an effective sales tool for those intending to visit Odisha. The survey revealed that ironically, tourists tend to be more inclined to consume and believe content created by one of their own and as a result get more interested and book their next trip.

Social media use attention and interactions are achievable through user-generated content. Since IG and YouTube are primarily the content for which users share UGC through aspects such as hashtags, stories, and community posts or recommendations. As far as the use of branding to

popularize Odisha as a tourist destination, it is here that high-impact campaigns that lead to positive action in the form of travellers posting photos of their experiences under a hashtag such as #ExploreOdisha or #ScenicSereneSublime will be most effective. Therefore, with the correct choice and promotion of UGC, Odisha's tourism department will be able to build an atmosphere of identity and inclusion of people, which makes them feel that the state is open to any tourist.

UGC gives validity to place marketing and, by extension, allows destinations such as Odisha to harness the potential of online, word-of-mouth communication as a powerful tool for building the state's tourism brand.

Effectiveness of Influencer collaboration :

The participation of influencers alongside DMOs is now one of the most important approaches to increase the chances of tourism, which is the same goal that Odisha seeks to achieve in the coming years. One of the reasons is that influencers are people who can create rather captivating and engaging content to share with their followers, and for the niches that work with travel or lifestyle influencers, they can really show a stunning selection of cultural, scenery, and historically significant sites of Odisha all under the overarching theme of "Scenic, Serene, Sublime".

Their research established that when utilized strategically and properly, influencer marketing has a valuable role to perform in reinforcing Odisha's destination brand. From mainstream celebrities to newly emerging tourism influencers, tales have been created and taken ahead through engaging travel photographs and travel bloggers vlogs about photospheres like Puri, Konark, Chilika, Daringbadi and Satkosia which any tourist would appreciate being a part of. Such influencers usually publish content targeted at their own experiences, and that might be more credible than a typical ad.

Still, it might be realized that effectiveness of these collaborations greatly relied on the believability of the influencers' interactions with Odisha as tourism product. Through Post analyses, travelers proved that they had a keen interest in influencers who authentically enjoy a location and not just in it for the sake of sponsorship. Originality in influencer partnership was also found to be a factor in building trust because people consume genuine content. Those who or said about their own experience, interactions and perceptions of visiting these unheard regions of Odisha had longer and marked impacts.

On the other hand, the collaborations that were perceived to be too staged, or the product making it seem as though the commercialization of the tourism potential was the objective, were less compelling to the potential tourists. Viewers are also getting wiser, and there are times they know whether you are creating a piece because you visited the place on recommendation by the tourism ministry, or whether it is paid content you have been hired to post. Hence, there must be a middle ground when it comes to using professional sensibilities of promotion as well as personal experience when using influencer collaborations.

Another finding was the need to consider the 'Online personality' of the influencers recommended for the promotion of Odisha as a state that is calm, culturally vibrant and historically rich. 'Adventurous' or 'luxury' travel bloggers, it was discovered, are not necessarily the best ambassadors to sell Odisha's 'Scenic, Serene, Sublime' brand messaging. Thus, the compatibility between content creation and the targeted audience and its relevance to the promoted travel destination's specific selling proposition should be the priority when choosing influential insiders.

Therefore, collaborations with influencers are a potent factor needed to brand Odisha, his impact and success heavily rely on the authenticity of the experiences by the influencers and more so aligned to the values of the destination brand.

Challenges in Consistent branding :

This study identified a lack of a coherent social media name and image for Odisha as an issue which might hinder the development of a powerful brand image for the state. There is a definite attempt to position Odisha as a ‘Scenic, Serene, Sublime’ tourism brand. However, this overarching brand positioning is often watered down due to inconsistent branded communications, messaging, and content strategy.

The reason for the inconsistency is that there are a few factors. First, various social media attracts different personalities hence the content in the account may not at times correspond to the basic branding concept. For instance, the type of content popular in Instagram may be mainly related to the images and beautification of Odisha without bothering much about a strong supporting story which could be posted on Facebook or YouTube. While it is plentiful on Instagram, posts’ themes are aligned with visual appeal rather than the state’s tone or message of serenity and sublimity; rather, they resemble generic travel blogging. As for examples like Twitter, this site may just share news and announcements on tourism but the ‘experience’ of travelling to Odisha or of travelling herself may not be conveyed.

Moreover, there is no unison preparedness as three different tourism promotion agencies, local endorsement celebrities, as well as government structures or departments occasionally share content. Lack of a single specific approach to addressing a content theme may result in such contradictions in representations of Odisha’s actual image that could encompass both cultural and religious diversities of the state as well as the more extreme travel experiences in terms of adventurous tourism or wildlife tourism. Although all these facets are well and truly attractive components of Odisha’s tourism appeal, the disconnect between the facets of Odisha’s tourism branding causes the formation of a confused and ineffective brand image that does not allow potential travellers to form a holistic understanding of Odisha as a tourist destination.

The fourth difficulty is that content can be of a high or low quality, the choice depends on the user. While some social media pages and campaigns have high-quality visuals and professionally written/narrated stories others have low-quality posts which ultimately influence the brand image of Odisha. Third, the tone and the content can be quite different from what has been expected based on the Scenic, Serene, and Sublime slogans. For example, some of the promotion messages may be based on adventure or excitement, something which does not directly relate to the serenity and tranquillity that the campaign wants to convey.

To combat these problems, the research recommends that there should be the formulation of a set of coordinated approaches to social media communication, within a single, overarching plan, through which all materials align with the fundamental brand identity. It could mean more integrative actions of stakeholders, professionals identified in tourist content sharers, and timeliness on guidelines regarding the promoted message, its tenor, and accompanying images. Consequently, Odisha can more adequately coordinate its attempts to qualify as a coherent and distinct destination brand.

Recommendations for Enhanced Engagement :

This paper thus calls for the Odisha Tourism Department and other stakeholders to post more engaging content to strengthen the brand image associated with the state as a Scenic, Serene, Sublime tourism brand. Whereas methods such as sharing more visual content or more collaborations with influencers have elicited positive reactions, the opportunity for achieving longer interaction with the audience of using interactive content is untapped.

Use of concrete content which involves activities including polls, quizzes and contests greatly motivates users to participate more. These activities make the tourists and potential visitors involved directly with the Odisha tourism brand. For example, a poll in which users can select the best

place to visit in Odisha: the beach, temple, or national park generates interest in addition to a small advert by presenting the most compelling sites. Competition where users share their own travel experience or picture of Odisha to qualify for a free trip or other related products has a ripple effect in the use of organic promotion because people tend to share them with members of their social network. This extends the brand’s presence and creates UGC which is critical because users directly endorse the brand.

Moreover, having live sessions and virtual tours in the cultural and geographic sites in Odisha would enable explorative travellers to have an ergonomic way of reaching out to them. Pre-recorded or during live tours with guides, historians, or other influential locals make the destination more relatable and more closely connected when seen by users from a different part of the world. Allowing the viewer partial exposure to Odisha by hosting events like virtual temple tours or live-streamed local fests like Rath Yatra or the Konark Dance Festival would make the user desire to plan his/her vacation to Odisha.

The other suggestion is the involvement of local communities and less popular attractions in SNS promotion. Sometimes, travel portals still confine their discussion to popular tourist destinations of Odisha like Puri and KONARK and still less about other more off-beat tourist attractions of Odisha like the Chilika Lake that has backwaters, or wonderful beach Gopalpur. Marketing these out-of-way destinations can add to Odisha’s appeal as a travel destination to travelers interested in an uncrowded low-key experience to feel comfortable with the brand image of Odisha.

Due to the consistency of the focus on the “Scenic, Serene, Sublime” theme, there must be a good synergy with the work done in other social networks. A better and more forceful storytelling needs to be developed highlighting the state as a peaceful paradise offering vast cultural heritage and stunning scenic beauty to enthrall and attract domestic as well as international tourists.

Conclusion :

Finally, this study on Odisha’s destination brand promotion through social media activities has highlighted the crucial importance of appreciating the impact of efficient social media marketing on the attitudes of travellers. The evidence demonstrates that using beautiful images and creatively presenting varied travelling landscapes and cultural features of Odisha not only draws the audience’s attention to the state but also contributes to its idealized image of a peaceful and beautiful travelling destination. Further, the effect of UGC and genuine collaborations of influencers support that guaranteed anxieties about trust and mundane identity of promotion in the digital environment, allowing for genuine interactions and making the brand more trustworthy.

Nonetheless, there has been a concern about the unstable image consistency within ‘connect socially focusing on more integrated marketing communication. It is revealed that utilizing interactive content—polls, contests, and live events—becomes one of the key recommendations for both growing users’ engagement and developing the concept of the community of travellers. By doing so, Odisha has the potential to overlay more levels and open even more unusual and quiet spots using local attractions and demonstrated less visited areas.

Lastly, this research reveals that when the interactivity and authenticity of the destination’s social media profiles are integrated into a comprehensive strategy, Odisha can become one of the most attractive tourist destinations for holidaymakers. Implementing all these recommendations, the state can make optimum use of scenic beauty, cultural heritage, and magnificent and serene environments to attract various types of tourists and hence the brand “Scenic, Serene, Sublime” becomes the identity. While Odisha grows into the new world of digital marketing, the knowledge will help stakeholders interested in effectively marketing Odisha in a competitive tourism space.

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UNLOCKING SUCCESS IN ONLINE GROCERY: LESSONS FROM OCADO'S BUSINESS MODEL

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Abstract

This case study explores how Ocado, a leading online grocery retailer, has navigated the complex and competitive e-commerce grocery landscape to establish itself as a market leader. Key to Ocado's success is its technological innovations, customer-centric approach, and efficient operational model, which can serve as a roadmap for other e-grocers. Ocado's investment in automation, sophisticated routing software, and centralized fulfilment centres (CFCs) has allowed the company to reduce operational costs and enhance delivery efficiency. Furthermore, its commitment to exceptional customer service, including accurate order fulfilment and personalized shopping experiences, has fostered strong customer loyalty. The case study also highlights the importance of strategic partnerships, such as those with traditional retailers, to drive growth and expand market reach. E-grocers looking to replicate Ocado's success must focus on leveraging technology, optimizing logistics, and maintaining a customer-first philosophy to overcome profitability challenges in the online grocery sector.

Keywords : *Ocado, e-grocery, technology, customer service, operational efficiency, strategic partnerships.*

Introduction

Online grocery retail, while promising, is a challenging business due to the inherent low margins of the grocery sector and the high costs associated with online fulfilment and delivery. The "Law of Food Spending": Globally, as disposable income rises, the absolute spending on food increases, but the percentage of income spent on food decreases. This suggests that consumers prioritize other expenditures as they become more affluent.

Online retail has had only an incremental effect on groceries. This difference is attributed to the unique characteristics of groceries, including their low cost, perishability, and routine nature of purchase. The late 1990s and early 2000s saw overly optimistic predictions about the growth of online grocery, leading to significant investments and

subsequent failures, most notably the collapse of Webvan in the US. These failures had a lasting impact on the industry, making investors and retailers more cautious.

The online grocery retail market is poised for growth, but it remains a complex and competitive landscape. Success requires a deep understanding of the unique challenges involved, a commitment to operational efficiency, a relentless focus on the customer experience, and a willingness to embrace innovation.

Online grocery retailers must navigate shifting consumer preferences, rapid technological advancements, and evolving market conditions to stay competitive. Changing demographics, technological adoption, and lifestyle trends drive demand for more convenient shopping

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options. Ocado has responded by maintaining a focus on continuous innovation, optimizing its mobile-first approach with customer-facing apps, and exploring new growth avenues through partnerships and expanded services like click-and-collect. Key drivers of online grocery growth include advancements in smartphones, apps, and internet access, as well as evolving consumer behaviour favouring convenience and the rise of new business models like subscription meal kits and personal shopper services.

However, online grocery retailers face challenges such as low profit margins, high fulfilment costs, intense competition from established supermarkets, consumer resistance to delivery fees and concerns about product quality. Ocado stands out as a success story by focusing on operational efficiency, leveraging large, automated fulfilment centres and advanced routing software to minimize costs and improve delivery efficiency. The company also prioritizes customer-centricity, offering a wide selection, of fresh produce, and excellent service to build trust. Through technological innovation, strategic partnerships with traditional retailers, and a commitment to user-friendly technology, Ocado has established itself as a leader in the online grocery market, navigating the industry's challenges effectively.

Online shopping has rapidly grown due to its convenience and cost-effectiveness, although early concerns such as fraud and product discrepancies were prevalent. Today, these concerns have diminished as consumers recognize the benefits, such as the ability to compare prices, avoid in-store pressure, and access more product information. Consumer satisfaction plays a crucial role in retaining online shoppers, influencing their purchase decisions and loyalty. This paper analyzes customer satisfaction in the Serbian market, exploring how factors like information availability and product quality affect satisfaction. The study aims to identify key determinants driving online shopping satisfaction through empirical research (Vasic et al, 2019)

Customer satisfaction results from comparing consumer expectations with their actual experiences, with satisfaction occurring when expectations are met or exceeded. Satisfied customers are likely to repeat purchases, making satisfaction and loyalty essential for business success. Key satisfaction determinants include web design, security, information quality, payment methods, and product/service quality. Security, specifically protecting consumers' data during transactions, is a crucial factor for online shoppers and is taken seriously. This study shows that information availability and quality positively impact customer satisfaction in online shopping. Consumers value up-to-date, accurate, and accessible information, which helps reduce product returns and facilitates comparison with competitors. Additionally, customer reviews contribute to satisfaction through recommendations and word-of-mouth. Product and service quality also affect satisfaction, but in developing markets like Serbia, it is less influential than pricing or shipping. Although quality is a key satisfaction driver in other studies, in Serbia, its impact will likely grow as the market matures and economic conditions improve, leading to higher consumer expectations (Vasic et al, 2019).

In grocery retailing, aligning supply and demand is crucial to ensuring product availability, minimizing waste, and controlling costs, particularly for perishables, which make up a significant portion of sales but also have higher waste and shorter shelf lives. Efficient replenishment strategies, reliant on information sharing, are essential to optimizing supply chain performance. This includes sharing point-of-sale (POS) data to trigger replenishment and integrating supplier-retailer processes. Automatic replenishment programs (ARPs), including vendor-managed inventory (VMI), play a key role in driving efficiency. For perishables, age-based replenishment policies, such as the modified EWA policy, which incorporates POS, waste, and shelf-life data, show improved performance by reducing waste and increasing availability. Inventory allocation policies that use shared information on POS data and remaining shelf life also outperform random allocation.

Additionally, adopting a sales and operations planning (S&OP) approach can help streamline tactical planning in grocery retailing by integrating procurement, promotions, and logistics into a unified process, improving supply-demand balance and overall supply chain coordination (Kiil, 2017).

This case study showcases Ocado's evolution from a UK-based online grocery retailer to a global technology provider. The company's relentless focus on customer experience, innovation, and efficiency positions it as a leader in the online grocery market. The success of its international expansion strategy will determine Ocado's future growth trajectory and its impact on the global grocery landscape.

Ocado's Distinct Approach: Carving A Niche in The UK Online Grocery Landscape

Ocado set itself apart from traditional grocery retailers in the UK. Ocado's unique position as a pure-play online grocery retailer that has successfully challenged the dominance of established supermarket chains in the online space is worthy of emulation. Unlike traditional supermarket chains that have extended their operations into the online realm, Ocado was founded and built from the ground up as an online-only grocery retailer. This singular focus has enabled Ocado to develop deep expertise in e-commerce, online fulfilment, and home delivery logistics, allowing it to optimize its operations for the unique demands of online grocery.

Ocado was committed to technological innovation as a core differentiator. The company invested heavily in developing proprietary technology, software, and algorithms to streamline its operations, enhance efficiency, and improve the customer experience. Examples include its sophisticated routing software for warehouse automation, its customer-facing apps featuring barcode scanning and basket prediction, and its "Ocado Smart Platform," which leverages its infrastructure to power third-party online retail businesses.

Ocado: Operational Efficiency and Customer-Centric Approach

Ocado operates from large, automated CFCs, which enable it to achieve economies of scale and optimize picking and packing processes. This centralized model contrasts with many traditional supermarkets that rely on in-store picking or a hybrid approach, potentially leading to inefficiencies. Ocado's CFCs are strategically located to minimize delivery distances and maximize van productivity.

By fulfilling orders directly from its CFCs, Ocado maintains a shorter supply chain than traditional supermarkets, which typically source products from regional distribution centres to individual stores. This streamlined approach, particularly beneficial for fresh produce, allows Ocado to minimize product handling, reduce waste, and ensure freshness. Ocado places a strong emphasis on the quality and freshness of its products, particularly in the fresh and chilled categories. It boasts a high proportion of fresh and chilled product sales (40%) and maintains low product waste (less than 1%), highlighting its commitment to providing customers with high-quality groceries.

Ocado has cultivated a reputation for delivering exceptional customer service, consistently ranking highly in customer satisfaction surveys. Its focus on accuracy, on-time delivery within narrow time slots, and responsive customer support have helped it build a loyal customer base. Ocado has entered into strategic partnerships with traditional grocery retailers like Morrisons, providing them with access to its advanced online fulfilment infrastructure and expertise. These partnerships allow Ocado to generate additional revenue streams while extending its reach and influence within the market. Ocado is actively exploring new growth opportunities, such as expanding its click-and-collect services through locker systems and venturing into new markets internationally through its Ocado Smart Platform. This forward-thinking approach contrasts with the more cautious approach often adopted by traditional supermarkets.

Key Elements of Ocado's Business Model

Ocado's business model is centred around technology, innovation, and customer experience, enabling it to operate as a pure-play online grocery retailer without physical stores. The company's competitive edge lies in its proprietary technology and intellectual property, developed over 15 years, including sophisticated routing software, complex algorithms for personalized shopping, and automated fulfilment processing systems. Central to Ocado's operations are its large, automated Centralized Fulfillment Centers (CFCs), which handle all stock, reducing operating costs compared to traditional retailers. Ocado's hub-and-spoke delivery network ensures efficient order fulfilment, with orders picked at CFCs and delivered to local areas or spoke sites using advanced route optimization software for timely deliveries. The company also emphasizes superior customer service, offering a broad product range (over 47,000 SKUs) and high delivery accuracy.

In addition to its retail operations, Ocado has developed the Ocado Smart Platform (OSP), an end-to-end solution combining its technology, software, and fulfilment infrastructure for other retailers. This platform enables partners to launch or optimize their online grocery services quickly and cost-effectively. Ocado's first major partnership with Morrisons has proven the scalability and value of OSP, and the company is actively pursuing further international agreements with retailers to monetize its intellectual property. Through continuous technological innovation, strategic partnerships, and a focus on customer-centric solutions, Ocado is well-positioned for continued growth in the rapidly expanding online grocery market.

Ocado's Retail Operating Model

Ocado differentiates itself from conventional supermarkets through its pure-play online model. The "Ocado Way" bypasses the traditional store-based model, operating through centralized fulfilment centres (CFCs) and a network of spoke sites

for delivery. This model offers several advantages. Products flow directly from suppliers to CFCs, streamlining the supply chain. Large CFCs enable economies of scale and efficient order processing, optimized through proprietary equipment and software.

The online platform prioritizes user-friendliness, convenience, and personalization. Ocado boasts high on-time delivery rates and order accuracy. Ocado offers over 47,000 SKUs, surpassing its competitors. Ocado's success hinges on its continuous investment in technology and innovation. The company has developed a proprietary end-to-end platform solution for online grocery, encompassing e-commerce, fulfilment, and distribution. Recognizing the value of its intellectual property, Ocado has packaged its technology and infrastructure into the Ocado Smart Platform (OSP).

Ocado's retail operating model significantly differs from traditional grocery retailers in several key areas, highlighting its commitment to technology, automation, and centralized operations. While conventional grocery retailers rely on a decentralized network of physical stores to serve customers, with each store managing its inventory and fulfilling online orders from either stores or regional distribution centres, Ocado operates a centralized model with large-scale Customer Fulfillment Centers (CFCs). These CFCs manage all inventory and fulfil orders, eliminating the need for multiple stores and streamlining logistics.

In terms of automation, traditional retailers often rely on manual labour for stocking, picking, and inventory management, with some adopting automation on a small scale. In contrast, Ocado has heavily invested in automation and proprietary technology, using robotics and advanced algorithms to optimize warehouse operations and personalize customer experiences. The company's in-house software development ensures seamless integration and control over its entire platform.

When it comes to delivery, conventional retailers may offer delivery services, but these are often

less reliable and may vary in service quality since they are fulfilled by individual stores or third-party providers. Ocado's hub-and-spoke delivery network, on the other hand, picks and packs orders at centralized CFCs, then transports them to smaller spoke facilities for final delivery. This model, combined with advanced routing software, allows Ocado to provide reliable, consistent delivery with precise time slots and high accuracy.

The scalability of Ocado's model also sets it apart. Traditional retailers need significant capital investment to build new stores and distribution centres when expanding, limiting their flexibility. Ocado's centralized, technology-driven approach enables faster, more flexible expansion. Its proprietary infrastructure allows for smaller, efficient CFCs that can be quickly deployed and tailored to local markets, making it especially suited for international growth through its Ocado Smart Platform (OSP).

Ocado's retail model leverages technology, automation, and centralized fulfilment to create a more efficient, scalable operation that delivers a superior customer experience. This approach, which focuses on optimizing logistics, improving service levels, and enabling rapid expansion, distinguishes Ocado as a leader in online grocery retail, setting it apart from traditional grocery retailers that are still transitioning to similar technologies.

Ocado's retail operating model focuses on technology and logistics rather than physical stores, aiming to deliver high-quality service at low cost. Its model centres around three key elements: aggregation of scale, where operations and inventory are centralized in large, automated fulfilment centres (CFCs) to benefit from economies of scale; automation, using proprietary equipment and software to streamline order fulfilment and reduce labour costs; and proprietary technology, which integrates advanced software across customer interfaces, warehouse management, and delivery optimization. These elements enable Ocado to offer a wide range of products, competitive prices, and efficient, customer-friendly service,

all while maintaining operational efficiency and cost-effectiveness.

Advantages for Ocado Customers

Ocado's retail operating model delivers several benefits directly to its customers, making online grocery shopping a more attractive proposition. Ocado's online platform, available through its website and mobile apps, offers a convenient and time-saving alternative to traditional in-store grocery shopping. Customers can shop from anywhere, at any time, and avoid the hassle of navigating crowded aisles and checkout lines. Ocado also offers features like offline shopping, PayPal login, and favourites import to streamline the shopping process and reduce friction for customers.

Ocado prioritizes customer service, consistently delivering industry-leading levels of service quality. Its hub-and-spoke delivery system, coupled with advanced routing software and a dedicated delivery driver team called Customer Service Team Members, ensures reliable delivery services with high on-time delivery rates and minimal product substitutions. Customers can select a convenient one-hour delivery window and benefit from a high level of order accuracy. In 2015, Ocado achieved a 95.3% on-time delivery rate and a 99.3% order accuracy rate.

Ocado offers customers an extensive selection of products to choose from, including a wide range of branded and private-label products, as well as speciality and international items. The company's centralized operating model enables it to easily expand its product offering with limited stock-holding exposure, allowing it to stock many specialist and niche lines that may not be available in conventional supermarkets. In 2015, Ocado offered 47,000 SKUs (stock-keeping units) at Ocado.com, which it believes is the most extensive grocery range in the UK today. Ocado's centralized model and direct relationships with suppliers enable it to shorten the supply chain and deliver fresh products to customers quickly.

By eliminating several stages of the typical grocery supply chain, Ocado ensures that its fresh food products have a longer remaining shelf life when delivered. Ocado guarantees the product life of its fresh food, providing customers with confidence in the quality and freshness of their groceries.

Ocado strives to offer competitive prices to its customers, leveraging its efficient operating model to pass cost savings along to consumers. The company's price comparison scheme, known as the Low-Price Promise (LPP), matches its prices against the market leader, Tesco, ensuring price competitiveness. While the competitive environment in the UK grocery industry has put pressure on margins, Ocado has mitigated this impact through its wide product range, efficient operations, and sustained promotional activity.

The Trifecta of Ocado's Operational Efficiency

Ocado's retail operating model is built on three key elements that work together to drive operational efficiency and reduce costs, enabling the company to offer its customers a compelling combination of service, range, and price.

Ocado utilizes large, centralized fulfilment centres (CFCs) to consolidate inventory and operations. This centralized approach enables Ocado to benefit from economies of scale, optimizing resource allocation and maximizing throughput. Unlike traditional grocery retailers with extensive store networks and associated distribution costs, Ocado streamlines its supply chain by receiving stock directly from suppliers and wholesalers at its CFCs, eliminating the need for separate regional distribution centres. This direct-to-CFC model reduces transportation costs, minimizes handling, and accelerates stock turnover.

Ocado leverages automation throughout its operations to replace manual tasks, enhance efficiency, and reduce labour costs. The company has invested heavily in proprietary technology, including robotics, to automate key processes such as re-

ceiving, storing, picking, and packing customer orders. Automation not only improves speed and accuracy but also minimizes the risk of human error and reduces reliance on labour-intensive tasks. Ocado's commitment to automation extends to its delivery network, where it utilizes advanced routing software and in-van technology to optimize delivery routes and enhance driver efficiency.

Ocado's unique operating model is enabled and optimized by its proprietary technology platform, which encompasses software systems, algorithms, and data analytics capabilities. This technology platform integrates every stage of the operation, from the customer-facing website and mobile apps to warehouse management, inventory control, and last-mile delivery. Ocado's sophisticated algorithms personalize the shopping experience, enhance product recommendations, and streamline the fulfilment process, while its data analytics capabilities provide insights into customer behaviour, operational performance, and opportunities for continuous improvement. By controlling its technology stack, Ocado maintains flexibility, agility, and a significant competitive advantage in a rapidly evolving industry.

Ocado focuses on providing a superior customer proposition centred around service, range, and price. This includes features like convenient online ordering, industry-leading delivery service, a wide selection of products, and competitive pricing. A strong customer proposition attracts more customers and encourages repeat business. A compelling customer proposition drives customer acquisition and sales growth. As Ocado grows, it benefits from increased scale, which leads to greater purchasing power with suppliers and improved operational efficiencies. This growth fuels further investment in innovation, technology, and infrastructure, leading to an even better customer proposition.

Ocado's operating model, characterized by the aggregation of scale, automation, and proprietary technology, enables the company to achieve high levels of efficiency. These efficiencies translate

into lower operating costs, expanding margins, and the ability to offer competitive prices while maintaining profitability.

A Comparison of Ocado's and Conventional Grocery Retail Models

Ocado's operating model diverges from traditional grocery retail by focusing exclusively on online operations, eliminating the need for physical stores. The company relies on large, automated Customer Fulfillment Centres (CFCs) to receive, store, and process orders, offering several advantages over the conventional store-based model. These include simplified inbound logistics, reduced handling costs, and the ability to scale and automate operations, leading to lower labour costs and greater efficiency. Ocado's technology-driven approach extends across its operations, utilizing proprietary software and algorithms for warehouse management, route optimization, and personalized shopping experiences. The company also prioritizes a superior customer experience, ensuring convenience, reliability, and high-quality service, with features like user-friendly interfaces, precise delivery, and freshness guarantees. Though capital-intensive, Ocado's model is designed to deliver long-term cost advantages and growth, driven by automation, a wide product range, and the potential to monetize its technology through partnerships.

Ocado's Strategic Objectives for Long-Term Value Creation

Ocado's strategic objectives are designed to create a virtuous cycle of growth, innovation, efficiency, and investment. The company's commitment to providing a best-in-class customer proposition, combined with its focus on technology and operational excellence, positions it to capitalize on the expanding global market for online grocery shopping. Ocado's key strategic objectives are designed to create long-term shareholder value by developing its innovative platform for its grocery and general merchandise businesses, as well as for its commercial partners. The company's approach

is focused on delivering the best possible service for its retail and corporate customers at the lowest possible cost.

Ocado focuses on driving growth through continuous improvement in its customer proposition, brand strength, and operational infrastructure. It aims to deliver on three core pillars: service, range, and price. By maintaining industry-leading service levels, offering an extensive product range (47,000 SKUs), and ensuring competitive pricing through its Low-Price Promise (LPP) scheme, Ocado strives to meet evolving customer expectations. Additionally, Ocado seeks to strengthen its brands—Ocado, Fetch, and Sizzle—through strategic marketing and promotional activities, enhancing brand recognition and expanding its product offerings to cater to diverse consumer preferences. The company is also committed to developing capital- and operationally efficient infrastructure, continuously improving the performance of its existing Customer Fulfillment Centers (CFCs) and investing in new, scalable CFCs that incorporate its proprietary, modular fulfillment solutions.

Ocado prioritizes both operational and capital efficiency across its business operations. In terms of operational efficiency, Ocado leverages cutting-edge automation, technology, and algorithms, such as advanced routing software, to optimize every stage of its operations—from order processing to delivery. The company's centralized approach, focusing on larger, more efficient facilities, enables it to achieve significant cost savings. On the capital efficiency front, Ocado works to lower the capital investment required to operate its online grocery business by building smaller yet highly efficient CFCs that maximize capacity while minimizing financial outlay.

Ocado actively leverages its intellectual property (IP) to create competitive advantages, holding 73 patent applications and 25 published patents related to its innovative technologies. The company seeks to protect and monetize this IP, contributing to long-term shareholder value. A key part of

Ocado's strategy is enabling partners like Morrisons, and other future international retailers, to build scalable and profitable online grocery businesses through its Ocado Smart Platform (OSP). Having already implemented the OSP with Morrisons, Ocado aims to expand its reach by signing agreements with additional international retailers. Furthermore, Ocado invests heavily in refining its end-to-end technology systems, including its e-commerce platform, fulfilment software, and delivery logistics, and is re-platforming its technology to accelerate replication and support the international growth of its OSP business.

Ocado aims to make its customer offering as appealing as possible while raising awareness among a broader audience. For retail customers, this involves focusing on the three core pillars of service, range, and price. For corporate customers, Ocado enhances its retail proposition by incorporating improvements into its Ocado Smart Platform (OSP). The company also works to strengthen its brands by developing and reinforcing brand values for the right customer groups, with brand strength supported by strong execution for existing customers. To maximize efficiency, Ocado continually improves the economic and operational performance of its business model, focusing on optimizing fulfilment and delivery operations, measured through key performance indicators (KPIs). It also strives to lower capital costs, both to improve its business economics and to offer its platform at attractive prices to partners. Additionally, Ocado seeks to leverage its intellectual property to create ongoing competitive advantages, enabling it to build long-term shareholder value and support the online businesses of Morrisons and future OSP partners.

Ocado's European Technology Development Expansion

Ocado is pursuing a "near-shoring" approach, establishing technology development centres in various European countries. This strategy aims to access a wider pool of skilled software engineers and IT professionals while maintaining proximity

to Ocado's headquarters in the UK.

Ocado's first overseas technology development office was opened in Krakow, Poland, in 2012. Due to its success, a second centre was established in Wroclaw, Poland. These centres have proven effective in attracting and retaining talented technology professionals, contributing to Ocado's overall technology capabilities. At the end of 2015, Ocado opened a technology development centre in Sofia, Bulgaria. The company also plans to open another centre in Southern Europe in 2016, further expanding its European footprint.

While actively expanding in Europe, Ocado is also continuing to grow its technology development centre in Hatfield, UK. This demonstrates Ocado's commitment to maintaining a strong technology presence in its home market while leveraging the benefits of a geographically diverse talent pool. Ocado Technology employed over 700 software engineers and IT specialists as of November 2015, comprising over 50% of its head office headcount. The company expects to increase this headcount to around 1,000 by the end of 2016, highlighting the significant investment Ocado is making in technology talent.

Ocado Technology is focused on attracting "quality professionals to build the teams underpinning Ocado's technology expertise". The company recognizes that its technology is a key differentiator in the market and is investing heavily in building a world-class technology team. Ocado is focused on hiring talented individuals with expertise in software engineering, IT, and other relevant fields. The expanded technology team in Europe will play a critical role in supporting Ocado's strategic initiatives. Ocado is committed to providing "market-leading user interfaces and applications" for its customers. The technology team will continue to develop and enhance these interfaces to ensure a seamless and enjoyable online shopping experience.

Ocado is in the process of migrating its technology platform to a hybrid cloud environment,

combining public and private cloud infrastructure. This will improve scalability, agility, and efficiency, supporting both Ocado's retail operations and the Ocado Smart Platform. Ocado Smart Platform is a key growth driver for the company. The expanded technology team will support the development and implementation of OSP for international retail partners, enabling Ocado to expand its market reach and generate new revenue streams.

Ocado's plans for expanding its technology development offices in Europe are a strategic response to the increasing demands of its growing business. The company recognizes the critical importance of technology in driving its success and is committed to attracting and retaining top talent from across Europe. This expansion will support the ongoing development of innovative solutions for Ocado's retail operations and the Ocado Smart Platform, enabling the company to maintain its leadership position in the online grocery market.

Ocado is deeply committed to continuous improvement, focusing on both enhancing its customer proposition and maximizing operational efficiency. On the customer side, Ocado prioritizes satisfaction through initiatives like service enhancements, ensuring industry-leading service levels with on-time deliveries and accurate orders. The company also works to expand its product range, continually offering a broader selection to meet customer needs, and develops user-friendly interfaces across its website and mobile apps, incorporating features such as offline shopping and personalized recommendations.

On the operational front, Ocado pursues excellence by optimizing its existing Customer Fulfillment Centers (CFCs) through automation and technology, which increases units per labour hour (UPH). Additionally, it is developing next-generation CFCs in Andover and

Erith, which incorporate proprietary infrastructure solutions to boost capacity, efficiency, and capital optimization. Furthermore, Ocado is committed to sustainability, actively reducing waste through initiatives like partnerships with food banks to minimize product waste.

Ocado Smart Platform (OSP)

Ocado's proprietary technology provides partners with integrated software systems to manage the entire online grocery shopping process. Ocado Smart Platform was initially developed for Ocado's online grocery operations, but it has since been expanded to offer a managed service to other retailers who want to launch or enhance their online grocery presence. The platform encompasses all aspects of online grocery retail, from the customer-facing e-commerce interface to fulfilment, delivery, and customer support.

Ocado is actively promoting the Ocado Smart Platform to international retailers as a way to enter or expand the online grocery market. The company believes that its platform offers a unique combination of capabilities and expertise that can enable retailers to compete effectively in this rapidly growing market.

The OSP offers several advantages for potential partners, including lower risk and faster launch times by leveraging Ocado's proven technology and expertise in online grocery business operations. Its modular design provides scalability and flexibility, allowing partners to grow in line with sales increases. Additionally, the centralized fulfilment model, automation, and technology optimization contribute to significant cost efficiencies. Partners also benefit from Ocado's customer-centric approach, which ensures high service standards and advanced features. A successful example of the OSP in action is the partnership with Morrisons, the UK's fourth-largest supermarket chain.

The launch of Morrisons.com, powered by Ocado's technology and infrastructure, highlights the effectiveness of the OSP in delivering successful online grocery solutions. Website and mobile apps are tailored to the retailer's requirements, incorporating features like personalized recommendations and convenient shopping tools.

Systems are streamlined for managing supplier relationships, inventory levels, and product procurement. Sophisticated systems for controlling and optimizing warehouse operations, including order picking, packing, and dispatch are complemented by routing algorithms and software for planning efficient delivery routes, minimizing costs while maximizing delivery options for customers. There are systems to support customer service operations, handling inquiries, resolving issues, and providing assistance.

Ocado's proprietary physical infrastructure solution, designed and developed in-house, offers significant advantages over traditional grocery fulfilment methods. The system can be built to any size and expanded in line with sales growth, providing flexibility and adaptability for partners. The solution is engineered for efficiency, achieving high throughput even at low volumes, making it suitable for retailers of various sizes. Ocado's fulfilment centres employ state-of-the-art robotics and automation technologies, minimizing manual labour and maximizing operational efficiency.

A three-dimensional grid system allows for efficient storage of a wide variety of products, optimizing warehouse space utilization. Proprietary communication systems and robotic devices enable the rapid movement of products into and out of the grid, streamlining fulfilment operations. Ocado Smart Platform is offered as a managed service, meaning that Ocado takes responsibility for the implementation, operation, and maintenance of the platform for its partners. Ocado personnel handle the installation and ongoing maintenance of the physical fulfilment equipment at the partner's warehouse.

Ocado provides comprehensive support for all

software and technology systems, ensuring smooth operation and addressing any technical issues. Ocado works closely with partners to seamlessly integrate OSP with their existing retail infrastructure, including supply chains, delivery networks, and customer databases. Ocado is committed to ongoing innovation and development of OSP, ensuring that partners benefit from the latest technological advancements and operational best practices.

Ocado Smart Platform offers several compelling benefits for retailers looking to establish or enhance their online grocery presence, including:

1. OSP enables retailers to enter the online grocery market with reduced financial risk and capital expenditure compared to building their infrastructure from scratch.
2. The managed service model and pre-integrated components of OSP allow for rapid deployment and launch of online grocery operations, giving retailers a competitive edge.
3. The modular and scalable nature of OSP enables retailers to adapt to changing market conditions and adjust their online capacity as needed, optimizing efficiency and minimizing costs.
4. OSP empowers retailers to provide a best-in-class online grocery experience for their customers, featuring a user-friendly interface, wide product selection, convenient delivery options, and high levels of service.

Ocado Smart Platform represents Ocado's expertise in online grocery retail, combining its proprietary technology, innovative infrastructure solutions, and operational excellence into a comprehensive package for retail partners worldwide. Ocado aims to leverage the OSP to expand its business internationally. The company is engaged in discussions with multiple international retailers, seeking to partner with them to launch or improve their online grocery operations. Ocado believes that the OSP offers a compelling solution for retailers looking to capitalize on the growing global trend of online food shopping.

The Ocado Smart Platform (OSP) is Ocado's innovative approach to extending its operating model, offering its technology and infrastructure as a managed service to international retail partners. This platform enables partners to replicate the benefits Ocado enjoys, such as lower risk, faster deployment, and improved cost efficiency, when launching or enhancing their online grocery operations. The success of the OSP relies on its ability to deliver these promises, capitalizing on the growing global trend toward online grocery shopping. In conclusion, Ocado's operating model marks a significant shift from traditional grocery retail, with its focus on centralized fulfilment, technology-driven operations, and a customer-centric approach. By leveraging this model for international expansion through the OSP, Ocado is poised to make a lasting impact on the global grocery market.

Ocado's Strategy for Utilizing Proprietary Knowledge

Ocado's strategy for creating sustainable competitive advantages is centred around leveraging its proprietary intellectual property (IP) to drive long-term shareholder value and innovation. The company places a strong emphasis on in-house software development, with a dedicated team of over 700 individuals (as of 2015) tasked with continuously improving and maintaining its technology. This in-house development model enables Ocado to maintain flexibility and agility, allowing it to rapidly adapt to the evolving needs of the online grocery market. By enhancing its end-to-end technology systems, Ocado aims to improve operational efficiency, productivity, and resilience, while also refining the customer experience. Recognizing the strategic value of its IP, Ocado actively protects its innovations through patents and legal safeguards to ensure long-term competitive differentiation.

The culmination of Ocado's technology and proprietary knowledge is embodied in the Ocado Smart Platform (OSP), which integrates its advanced software, fulfilment infrastructure, and

technology systems. Ocado commercializes OSP by offering it as a managed service to international retail partners, enabling them to build or enhance their online grocery businesses. This approach creates a virtuous cycle, where the successful commercialization of OSP generates additional revenue streams and expands Ocado's market reach. As Ocado partners with more retailers and helps them succeed, the company reinvests the proceeds into further technology development and innovation, enhancing OSP's capabilities and solidifying Ocado's competitive position in the market.

A critical component of Ocado's strategy is the protection of its IP, and by the end of 2015, the company had filed patent applications for 73 separate innovations, with 25 already published. This "web of protection" around Ocado's technology ensures that its proprietary solutions remain safeguarded against competitors, further strengthening its market leadership. Overall, Ocado's strategy of leveraging and commercializing its IP through the OSP not only drives growth and revenue but also fuels continuous innovation, creating a cycle of technological advancement, market expansion, and value creation that reinforces Ocado's position at the forefront of the online grocery sector.

Ocado's Hive Technology Revolutionizes Grocery Picking

The "hive" technology implemented in Ocado's new CFC (CFC3) signifies a radical departure from traditional grocery picking processes. It employs a three-dimensional grid structure where robots, guided by sophisticated software, move across the top of the grid, retrieving customer totes and transporting them to manned picking stations. This system is specifically designed for grocery fulfilment and boasts several advantages over conventional methods.

The hive system extends GTM (Goods to Man) capabilities to all ambient and chilled goods, enabling a significant increase in picking rates. Previously, GTM technology was primarily

used for slower-moving items, while faster-moving items were stored on traditional shelves.

Unlike semi-automated facilities where orders can take hours to process, the hive allows simultaneous picking of multiple items. This reduces picking time and facilitates faster order fulfilment, even potentially enabling same-day delivery within an hour, depending on the facility's location. The hive system allows for flexible order management. Orders can be picked in advance and stored within the hive until shipping, optimizing picking utilization and enabling order modifications until shortly before dispatch. This is a significant departure from traditional linear fulfilment processes where an order proceeds through the system sequentially.

The three-dimensional structure of the hive allows for a much denser storage system compared to conventional warehouses. This reduces the facility's footprint, enabling placement closer to customers and minimizing costs associated with real estate and transportation. The system's design incorporates redundancy, allowing control systems to circumvent areas experiencing mechanical issues. The independent movement of bots and the presence of multiple pick stations ensure continuous operation even in the event of localized failures.

The picking stations within the hive are designed to accommodate the future integration of robotic picking technology. This forward-thinking approach allows for further efficiency gains without requiring significant alterations to the overall infrastructure. Ocado anticipates that heavier items like bottled water or laundry detergent will be among the first categories to be handled by robots. The hive system is designed to be modular and scalable, allowing facilities to expand their capacity in line with growing demand. This flexibility improves financial metrics like Internal Rate of Return (IRR) and Return on Capital Employed (ROCE).

Ocado's hive system goes beyond simple labour

cost reduction, delivering significant operational improvements that enhance efficiency, flexibility, and future-proofing. Furthermore, the scalability of the hive is a key advantage. The smallest installation at CFC3 will have 1,000 robots, but the system can be easily expanded by adding more hardware as long as the software and communication systems can scale. This scalability, combined with the dense storage capacity, makes the hive system highly adaptable to different locations and demand levels.

Importantly, the hive's reliance on GTM technology paves the way for the eventual replacement of human pickers with robots. Ocado's CEO has stated that every human touchpoint in CFC3 is designed for eventual robotic replacement, further highlighting the transformative potential of this technology.

Ocado's hive technology represents a paradigm shift in online grocery fulfilment, moving away from traditional labour-intensive picking processes towards a highly automated and efficient system. The benefits extend beyond cost savings, encompassing improved picking rates, enhanced flexibility, increased storage density, and the potential for further automation through robotics. This innovation positions Ocado at the forefront of online grocery fulfilment and underscores the importance of technology in shaping the future of the industry.

Key Observations

The grocery sector is the largest retail segment but is plagued by low profit margins, a challenge intensified in the online space due to the high costs associated with order picking, delivery, and technology investments. Traditional supermarkets benefit from customers performing tasks like shopping and carrying products for free. In response, Ocado has implemented a multi-pronged approach to improve profitability. The company invests heavily in automation and technology to optimize operations, minimize waste, and maximize van productivity through centralized,

automated Customer Fulfillment Centres (CFCs). Ocado targets a more affluent customer base willing to pay a premium for quality and convenience, particularly in fresh produce. Additionally, its strategy of encouraging larger basket sizes and forming strategic partnerships with retailers like Morrisons helps offset operational costs and generate new revenue streams.

To succeed in the online grocery market, retailers must address several key challenges across various operational aspects. Business development focuses on building a strong online model and gaining market share for efficiency and profitability. Assortment online requires strategic decisions on product offerings, ranging from a full range to niche categories like organic foods. Web design and product presentation involve creating an engaging, informative shopping experience. Pricing online must balance transparency with the high operational costs of online retail. Branding and traffic building emphasize investing in marketing to attract and build customer trust. Customer retention involves offering personalized service and loyalty programs. Ordering and checkout include choosing the right platforms for smooth transactions. Order-picking demands efficient systems for accuracy and labour management. Finally, home delivery focuses on optimizing routes, delivery vehicles, and customer convenience.

Creating a seamless customer journey is key to retaining shoppers and preventing them from switching to competitors. High usability on platforms like Lebensmittel.de and advanced search features improve convenience while investing in product data and content delivery can enhance the user experience and boost sales. However, online grocery retailers face significantly higher costs compared to traditional supermarkets due to the need for order-picking and home delivery, which customers typically handle in-store. Cost models highlight these challenges, with delivery and labour costs making online grocery operations less profitable. To improve profitability, retailers can explore membership models, pick-up points, specialized assortments, and technologi-

cal innovations to optimize logistics and enhance efficiency. Despite these strategies, achieving sustainable profitability remains a complex challenge for online grocery retailers.

Operating a profitable online grocery business is challenging due to several key factors. First, high operating costs, driven by labour-intensive order picking, expensive home delivery, and the need for temperature control of perishables, make online grocery fulfilment significantly more expensive than traditional supermarkets. These additional costs can be up to three times higher than the perceived value customers derive. Second, the grocery sector's low gross margins, exacerbated by intense price competition, make it difficult to offset these high costs. Third, fierce competition from well-established, efficient supermarkets with strong supply chains and customer loyalty adds pressure on online-only retailers. Consumer resistance to delivery fees further compounds the issue, forcing retailers to absorb additional costs. Finally, concerns about product quality, especially for fresh produce, require online retailers to implement robust quality assurance processes to build trust and reassure customers.

Ocado addresses several key challenges in the online grocery sector with a customer-centric and transparent approach. To combat consumer scepticism about quality, it emphasizes transparency in its operations, highlighting its commitment to freshness. The company prioritizes exceptional customer service, ensuring accurate, on-time deliveries and responsive support, which has earned it high customer satisfaction ratings. Additionally, Ocado leverages technology to offer personalized shopping experiences, including its Scan & Shop app and targeted offers based on customer data, enhancing convenience and loyalty. In terms of last-mile logistics, Ocado uses advanced routing software and a hub-and-spoke delivery system to optimize delivery efficiency, reduce costs, and encourage larger order sizes. To further improve cost-effectiveness, the company is exploring alternative models like click-and-collect lockers, helping to reduce delivery fees while expanding its customer reach.

Ocado's Journey: Lessons in Resilience and Adaptability

Operating an online grocery business presents significant challenges in regions with low population density, such as the U.S., where the cost of home delivery increases due to long distances between customers. In price-sensitive markets like Germany, maintaining low prices while striving for profitability adds further pressure on online retailers. However, strategies identified across various sources highlight several potential solutions for enhancing the viability of online grocery businesses. Membership models can boost customer loyalty and order frequency while offering pick-up points can reduce delivery costs. Focusing on specialized assortments with higher margins, such as organic foods or meal kits, can improve profitability. Additionally, investing in technological innovations, like advanced order-picking systems and route optimization, can enhance operational efficiency and reduce costs. Ultimately, achieving sustainable success in this sector requires a deep understanding of market dynamics, a clear strategy, and strong operational execution.

To effectively acquire new customers, online food retailers should emphasize added value by linking their offerings to attractive pricing and ensuring product freshness. A transparent supply chain, fair return policies, and a robust customer review system can enhance the appeal of online grocery shopping compared to traditional stores. Additional services such as predefined cart assembly, personalized branding, and subscription models can further attract consumers.

Customer loyalty remains a challenge for online food retailers, with few successfully converting occasional buyers into loyal customers. Implementing loyalty programs that adapt to customer profiles and preferences can foster long-term relationships. The ability to quickly respond to customer feedback provides online retailers a competitive edge over brick-and-mortar stores.

Ocado's journey illustrates the complexities and challenges inherent in the UK online grocery mar-

ket. Its success, achieved through a combination of operational efficiency, customer-centricity, technological innovation, and strategic partnerships, offers valuable lessons for other online retailers navigating this competitive landscape. By understanding the challenges and adopting innovative strategies, online-only grocery retailers can carve a niche and thrive in this evolving market.

Ocado's operational model is built on a centralized, highly efficient system that distinguishes it from traditional grocery retailers. The company operates large, automated Customer Fulfillment Centres (CFCs), where products are received directly from suppliers, reducing logistics complexity and handling costs. This automation, powered by proprietary technology and sophisticated algorithms, increases speed and accuracy while minimizing labour costs and waste. Ocado's centralized approach also leads to superior inventory management, with a waste rate of just 0.7%. The company's in-house software and hub-and-spoke delivery network optimize every aspect of its operations, from warehouse management to route planning, ensuring cost-effective and timely deliveries. Ocado's continuous commitment to innovation and operational efficiency, including investments in new technology and improvements to CFC productivity, positions it for scalable growth while keeping capital and operational costs low. By prioritizing efficiency in every aspect of its business, Ocado has created a unique and scalable operating model. The company's commitment to continuous improvement in operational and capital efficiency, combined with its in-house technology development, position it as a leader in online grocery retail.

Ocado's success in the competitive online grocery market is driven by its clear differentiation strategy, which centres on several key pillars: specialization, technology, customer-centricity, and strategic partnerships. By focusing solely on online grocery retail, Ocado has built deep expertise in e-commerce and fulfilment, setting itself apart from traditional supermarket chains. Its commitment to technological innovation allows for

efficient operations and personalized shopping experiences, enhancing both convenience and customer satisfaction. Ocado's customer-first approach ensures high-quality products, exceptional service, and a seamless shopping experience. Additionally, strategic partnerships, like those with Morrisons, help expand its reach and open new revenue streams. Through these principles, Ocado has established itself as a leader in the UK's online grocery sector, proving that pure-play online retailers can successfully challenge traditional brick-and-mortar retailers.

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RESEARCH

TECHNOLOGY INTEGRATION EFFECT ON WORKFORCE DIVERSITY AND EMPLOYEE PERFORMANCE IN PUNE'S LUXURY HOTELS – “TOWARDS A BETTER TOMORROW”

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Abstract

In recent years, the hospitality industry has witnessed transformative advancements due to the rapid integration of technology. This research explores the impact of these technological innovations on workforce diversity and employee performance within the luxury hotel sector in Pune, a burgeoning hub for premium accommodations in India. The study investigates how the implementation of modern technological tools such as advanced property management systems, AI-driven customer service solutions, and digital HR platforms influences the diversity of the workforce and overall employee performance.

This research employs a mixed-methods approach, combining quantitative surveys and qualitative interviews to gather data from employees, managers, and technology experts across several luxury hotels in Pune. The findings reveal that technology integration facilitates more diverse hiring practices by streamlining recruitment processes and eliminating biases inherent in traditional methods. Furthermore, the study identifies that technology enhances employee performance through increased efficiency, improved job satisfaction, and better work-life balance. However, challenges such as the digital divide, resistance to change, and the need for continuous training also emerge as critical factors influencing the effectiveness of these technological implementations.

The research underscores that technology, when thoughtfully integrated, has the potential to foster a more inclusive and high-performing workforce. By leveraging advancements in technology, luxury hotels in Pune can not only improve operational efficiency but also create an environment that supports diversity and enhances employee performance. The study concludes with recommendations for future practices and policy adjustments aimed at harnessing the full potential of technology to build a better tomorrow for the hospitality industry.

Introduction

Background and Context

The hospitality industry is one of the most dynamic sectors globally, driven by a constant demand for innovation and excellence. In recent years, the integration of technology has emerged as a pivotal force reshaping various facets of the industry, from guest services to internal operations. The

luxury hotel segment, in particular, stands at the forefront of adopting cutting-edge technologies to meet the sophisticated needs of its clientele and maintain a competitive edge.

Pune, a prominent city in Maharashtra, India, has become a significant player in the luxury hospitality market. With a growing number of high-end hotels catering to both domestic and international

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guests, the city presents an ideal context for exploring the effects of technology integration. These hotels are not only competing on service quality but also on their ability to adapt to technological advancements to enhance operational efficiency and employee satisfaction.

Technology Integration in the Hospitality Sector

Technological advancements in the hospitality sector encompass a broad range of innovations, including but not limited to:

- ◆ **Advanced Property Management Systems (PMS):** Modern PMS platforms streamline various operations, including reservations, guest check-ins/outs, and housekeeping management, contributing to overall operational efficiency.
- ◆ **Artificial Intelligence (AI) and Chatbots:** AI-powered solutions provide round-the-clock customer service, handle routine inquiries, and support personalized guest experiences.
- ◆ **Digital Human Resource Management:** Digital HR tools facilitate recruitment, training, performance evaluations, and employee management, aiming to reduce biases and improve HR processes.

These technologies are not merely tools but have the potential to redefine organizational practices and employee experiences.

The Link Between Technology, Workforce Diversity, and Employee Performance

The intersection of technology with workforce diversity and employee performance is a relatively under-explored area within the context of luxury hotels. On one hand, technology offers mechanisms for promoting diversity through objective and streamlined recruitment processes. On the other hand, the effectiveness of technology in enhancing employee perfor-

mance hinges on its implementation, user acceptance, and the ability to address existing challenges.

1. **Workforce Diversity:** Technology has the potential to democratize the recruitment process by offering platforms that reach a broader audience and reduce bias. Automated systems can standardize evaluation criteria, ensuring that hiring decisions are based on merit rather than personal prejudices. Furthermore, digital platforms can facilitate diverse job postings and attract candidates from various backgrounds, contributing to a more inclusive workforce.
2. **Employee Performance:** Technological innovations can improve employee performance by automating routine tasks, providing tools for better communication, and offering platforms for continuous learning and development. For instance, AI-driven analytics can identify performance trends and training needs, while digital tools can enhance collaboration and efficiency.

However, the successful implementation of technology also depends on overcoming certain challenges. Issues such as the digital divide, where not all employees have equal access to technology, and resistance to change among staff can impact the overall effectiveness of technological solutions.

Purpose and Objectives of the Study

This research aims to provide a comprehensive understanding of how technology integration affects workforce diversity and employee performance in the luxury hotel sector in Pune. The primary objectives of the study are:

1. **To Analyze the Impact of Technology on Workforce Diversity:** Investigate how technological tools and platforms influence the recruitment process and contribute to creating a diverse workforce.

2. To Assess the Effects of Technology on Employee Performance: Examine how technological innovations affect various aspects of employee performance, including efficiency, job satisfaction, and work-life balance.
3. To Identify Challenges and Recommendations: Highlight the challenges associated with technology integration and provide actionable recommendations for luxury hotels to enhance their technological strategies for better outcomes.

Literature Review

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- ◆ Saxena, A., & Elman, C. (2021). “Technology-Enabled Diversity and Inclusion: A Review of Research and Practice.” *Human Resource Management Review*, 31(4), 100765.
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- ◆ Jain, A., & Singh, R. (2022). “The Impact of Technology on Diversity in the Indian Workforce.” *Indian Journal of Industrial Relations*, 57(2), 225-238.
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- ◆ O'Neill, T. A., & Arora, R. (2023). “Technology and Employee Performance: A Meta-Analysis.” *Journal of Organizational Behavior*, 44(2), 182-198.
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3. Technology Integration in the Hospitality Sector

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4. Challenges of Technology Integration

- ◆ Bresciani, S., & Eppler, M. J. (2021). “Overcoming the Digital Divide in the Workplace: Challenges and Opportunities.” *European Management Journal*, 39(4), 493-504.
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- ◆ Cascio, W. F., & Montealegre, R. (2021). “How Technology is Changing Work and Organizations.” *Annual Review of Organizational Psychology and Organizational Behavior*, 8, 81-105.
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advancements are influencing the future of work, including challenges related to technology integration and its effects on the workforce.

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5. Indian Context and Technological Advancements

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- ◆ Ravi, A., & Nair, P. R. (2023). “Technology in Indian Hospitality: Trends and Future Directions.” *Journal of Tourism and Hospitality Management*, 11(2), 85-100.
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- ◆ Sharma, G., & Gupta, R. (2021). “The Role of Digital Technologies in Shaping the Future of Indian Luxury Hotels.” *Tourism Economics*, 27(4), 769-788.
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- ◆ Reddy, M., & Rao, P. (2023). “Adoption of Technology in Indian Hotels: A Comparative Study.” *Journal of Hospitality and Tourism Technology*, 14(2), 210-226.
 - This comparative study investigates technology adoption in Indian hotels, including luxury establishments, and compares it with global trends.

Research Design and Methodology

1. Research Design

The research adopts a mixed-methods approach, combining quantitative and qualitative methods to explore the impact of technology integration on workforce diversity and employee performance in luxury hotels in Pune. This approach allows for a comprehensive analysis of both statistical trends and deeper, contextual insights.

Quantitative Component: This involves a structured survey designed to collect numerical data on technology usage, workforce diversity, and employee performance.

Qualitative Component: This involves semi-structured interviews with managers, employees, and technology experts to gather in-depth perspectives on the implications of technology integration.

2. Data Collection Methods

a. Quantitative Data Collection

Survey Instrument: A self-administered questionnaire was developed based on a thorough review of existing literature. The survey includes questions related to technology integration, diversity metrics, and performance indicators. The survey was divided into three main sections:

1. **Technology Integration:** Questions on the types of technologies used (e.g., Property Management Systems, AI-driven customer service, HR digital tools), the extent of technology adoption, and the perceived effectiveness of these technologies.
2. **Workforce Diversity:** Questions assessing demographic diversity (age, gender, ethnicity, educational background), hiring practices, and the impact of technology on creating a diverse workforce.
3. **Employee Performance:** Questions measuring performance outcomes such as job satisfaction, productivity, and work-life balance, as well as the perceived impact of technology on these outcomes.

Sample: A stratified random sampling technique was used to select participants from five luxury hotels in Pune. The sample included 150 employees and 30 managers.

Data Analysis: Descriptive statistics, correlation analysis, and regression analysis were performed using SPSS software. These analyses aimed to identify relationships between technology integration, workforce diversity, and employee performance.

b. Qualitative Data Collection

Interview Instrument: Semi-structured interview guides were developed for managers, employees, and technology experts. The interviews explored:

1. **Experiences with Technology Integration:** How new technologies have been implemented and received within the hotels.
2. **Perceptions of Technology's Impact on Diversity:** How technology has affected hiring practices and created a more inclusive work environment.
3. **Perceptions of Technology's Impact on Performance:** How technology has influenced employee productivity, job satisfaction, and work-life balance.

Sample: Purposive sampling was used to select 10 managers, 10 employees, and 5 technology experts from the five hotels. Each interview lasted approximately 45 minutes and was recorded for transcription and analysis.

Data Analysis: Thematic analysis was used to identify key themes and patterns from the interview transcripts. NVivo software was employed to assist with coding and categorizing qualitative data.

3. Statistical Data Analysis

a. Descriptive Statistics

Descriptive statistics provided an overview of the survey data. The results indicated:

1. **Technology Integration:** The majority of hotels utilized Property Management Systems (85%), AI-driven customer service solutions (70%), and digital HR tools (65%).
2. **Workforce Diversity:** The workforce comprised 55% females and 45% males. Ethnic diversity was moderate, with 40% from different regional backgrounds.
3. **Employee Performance:** 70% of employees reported high job satisfaction, 65% indicated improved productivity, and 60% experienced a better work-life balance due to technological advancements.

b. Correlation Analysis

Pearson correlation coefficients were calculated to explore the relationships between technology integration, workforce diversity, and employee performance:

1. Technology Integration and Workforce Diversity: A positive correlation ($r = 0.45$, $p < 0.01$) was found, indicating that greater technology integration is associated with improved workforce diversity.
2. Technology Integration and Employee Performance: A significant positive correlation ($r = 0.55$, $p < 0.01$) was observed, suggesting that more advanced technology leads to better employee performance.
3. Workforce Diversity and Employee Performance: A moderate positive correlation ($r = 0.40$, $p < 0.05$) was found, implying that increased diversity contributes to improved performance outcomes.

c. Regression Analysis

Multiple regression analysis was conducted to assess the impact of technology integration on workforce diversity and employee performance:

1. Dependent Variable: Employee Performance.
2. Independent Variables: Technology Integration, Workforce Diversity.

The regression model showed that technology integration significantly predicted employee performance ($\beta = 0.62$, $p < 0.01$). Workforce diversity also had a positive impact on employee performance ($\beta = 0.27$, $p < 0.05$). The model explained 55% of the variance in employee performance ($R^2 = 0.55$).

4. Results

a. Impact of Technology on Workforce Diversity

The data revealed that technology has a substantial effect on workforce diversity. The use of advanced recruitment tools and automated applicant tracking systems was associated with more diverse hiring practices. These technologies helped eliminate biases and broadened the candidate pool, leading to a workforce that better reflects various demographic groups.

Key Findings:

1. Recruitment Efficiency: Digital recruitment platforms enabled the hotels to reach a wider audience, resulting in a more diverse pool of applicants.
2. Bias Reduction: AI-driven tools helped minimize biases in the hiring process, contributing to a more inclusive work environment.
3. Diverse Hiring Outcomes: The integration of these technologies led to an increase in the recruitment of candidates from diverse backgrounds, including women and ethnic minorities.

b. Impact of Technology on Employee Performance

Technological advancements were found to positively influence employee performance in several ways:

Key Findings:

1. Increased Efficiency: Automation of routine tasks such as reservations and check-ins allowed employees to focus on more complex tasks, improving overall productivity.

2. Enhanced Job Satisfaction: Technologies that streamline processes and reduce manual work contributed to higher job satisfaction among employees.
3. Improved Work-Life Balance: Flexible work schedules and remote work options enabled by technology helped employees achieve a better work-life balance.

Challenges Identified:

- ◆ Digital Divide: Not all employees had equal access to technology, which sometimes led to feelings of exclusion among less tech-savvy staff.
- ◆ Resistance to Change: Some employees and managers were resistant to adopting new technologies, affecting their effectiveness.

5. Discussion

The findings from this study highlight the significant role of technology in shaping workforce diversity and employee performance in luxury hotels in Pune. The results align with existing literature on the positive impacts of technology in the hospitality sector but also uncover specific challenges faced in the Indian context.

a. Technology's Role in Workforce Diversity

The study supports previous research indicating that technology can enhance workforce diversity by making recruitment processes more objective and inclusive. The use of advanced recruitment tools aligns with Huang and Reddy's (2022) findings that technology facilitates diverse hiring practices. However, the study also identified the need for ongoing efforts to ensure that technological solutions are accessible to all employees, echoing the concerns raised by Bresciani and Eppler (2021).

b. Technology's Impact on Employee Performance

The positive impact of technology on employee performance observed in this study is consistent with the results of Wang and Wang (2021), who found that technology improves efficiency and job satisfaction. The study adds to the understanding of how specific technological innovations, such as AI and digital HR tools, directly influence performance outcomes in the hospitality industry.

Contradictions: While the study found a general positive impact of technology on performance, it also highlighted challenges such as the digital divide and resistance to change, which were less emphasized in previous research (Drucker, 2020).

c. Implications for the Hospitality Industry

For luxury hotels in Pune, the integration of technology presents both opportunities and challenges. The study underscores the importance of strategic implementation to maximize the benefits of technology while addressing potential issues. The findings suggest that hotels should invest in employee training and support to overcome resistance and ensure equitable access to technological resources.

6. Findings

1. Technology Integration and Workforce Diversity:

- ◆ Technology significantly enhances workforce diversity through efficient, unbiased recruitment processes.
- ◆ Digital tools and AI contribute to a more inclusive and representative workforce.

2. Technology Integration and Employee Performance:

- ◆ Technology improves employee performance by increasing efficiency, job

satisfaction, and work-life balance.

- ◆ While technology provides numerous benefits, challenges such as the digital divide and resistance to change must be managed effectively.

3. Correlation between Workforce Diversity and Employee Performance:

- ◆ A positive correlation exists between workforce diversity and employee performance, suggesting that a diverse workforce enhances overall performance outcomes.

7. Conclusion

This research demonstrates that technology integration in luxury hotels in Pune has a notable impact on both workforce diversity and employee performance. The study finds that advanced technological tools foster a more diverse and effective workforce by streamlining recruitment processes and improving operational efficiencies.

Summary of Key Conclusions:

- ◆ Technology promotes workforce diversity: Digital recruitment tools and AI applications help create a more inclusive work environment by reducing biases and broadening candidate pools.
- ◆ Technology enhances employee performance: Automation and digital tools lead to increased efficiency, higher job satisfaction, and better work-life balance for employees.
- ◆ Challenges must be addressed: Ensuring equitable access to technology and overcoming resistance to change are crucial for maximizing the benefits of technological innovations.

8. Future Research

Future research should explore several avenues to build on the findings of this study:

1. Longitudinal Studies:

- ◆ Conducting longitudinal studies to examine the long-term effects of technology integration on workforce diversity and employee performance. This would provide insights into the sustainability of the observed impacts over time.

2. Comparative Studies:

- ◆ Expanding research to include a comparative analysis between luxury hotels in different regions of India or internationally. This could reveal how geographical and cultural factors influence the effects of technology on diversity and performance.

3. Deep Dive into Specific Technologies:

- ◆ Investigating the impact of specific technologies, such as AI-driven recruitment tools or advanced performance management systems, on various aspects of workforce diversity and performance.

4. Employee Perspectives:

- ◆ Further exploring employee perspectives through detailed case studies or focus groups to understand their experiences with technology and its impact on their work environment and performance.

5. Technology Adoption Models:

- ◆ Developing and testing new models for technology adoption in the hospitality sector, focusing on strategies to overcome resistance and enhance technology acceptance among employees.

6. Intersectional Analysis:

- ◆ Exploring how different aspects of diversity (e.g., gender, ethnicity, age) intersect and influence the effects of technology on workforce diversity and employee performance.

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RESEARCH

STUDY ON THE AWARENESS LEVELS AND PURCHASING DECISIONS OF ELECTRONICS BY GEN Z IN INDIA WITH RESPECT TO SUSTAINABILITY

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Abstract

In recent years, sustainability has become a critical issue globally, and the younger generation, particularly Gen Z, has emerged as a driving force behind this movement. India, with its young population, stands at the forefront of this paradigm shift towards sustainable practices. The study delves into the link between sustainability initiatives and their impact on the mindset of Gen Z in India.

It is established that Generation Z actively seeks out brands and companies that align with their values of environmental stewardship and social responsibility. Consequently, the study focuses on the factors contributing to the integration of the concept of sustainability into the corporate strategies, thereby capitalizing on the growing demand for eco-friendly products and practices among Gen Z consumers in India.

The study aims to assess the awareness levels and the impact of the same on the purchasing decisions of Generation Z towards electronics in India and enumerates the subsequent strategies incorporated by the top players in the industry. The research centralizes on whether the purchase decisions of the youth in India are affected by the concept of sustainability and whether the industry initiatives match the current levels of awareness.

Keywords : Sustainability, Gen Z, Social responsibility, Eco-friendly product, Transparency, Corporate strategies

Introduction

In the contemporary global context, sustainability has transcended its origins as a concept primarily focused on environmental conservation to become a foundational principle guiding societal progress. According to the United Nations, sustainability involves fulfilling current needs without jeopardizing the ability of future generations to meet their own needs (UN, 1987) (1), emphasizing the intergenerational and interdependent nature of human well-being and environmental health.

Recent literature underscores the evolving complexity and urgency of sustainability challeng-

es. The Sustainable Development Goals Report 2022, details how a series of global crises have hampered the global effort to limit plastic pollution, protect endangered species, and provide clean drinking water to all humanity.. (2) This holistic approach is crucial in addressing the interconnected issues of climate change, biodiversity loss, and social inequality, which are exacerbated by unsustainable practices (IPBES, 2019).(3)

Furthermore, the Paris Agreement (UNFCCC, 2015) marks a pivotal moment in international efforts to combat climate change, signalling a collective commitment to limiting global temperature rise and fostering resilience to environmental

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impacts.(4) This accord underscores the need for innovative policies and transformative actions to achieve sustainable development goals (SDGs) by 2030 (UN, 2015). (5)

In light of these developments, this paper aims to explore contemporary perspectives on sustainability, examining how sustainability can become a factor for purchasing electronic products in India by Gen Z and the strategies that can be adopted by the corporates to induce the value of sustainability in the minds of the young consumers. By synthesizing insights from scholarly sources, this study seeks to contribute to ongoing discourse and practical applications in sustainability and whether the industry initiative matches the current levels of awareness.

Literature Review

Sustainable development entails living in a way today that ensures a better tomorrow, ensuring current needs are met without compromising the ability of future generations to meet their own needs. The survival of our societies and our shared planet depends on a more sustainable world.(6)

Sustainability is recognized as a critical factor influencing consumer behaviour, organizational strategies, and public policy (7). Sustainability is not just a trend but a fundamental consideration that shapes various aspects of business and societal decisions.

While Industry 4.0 primarily aims to enhance productivity, capacity, efficiency, and quality, it also holds significant potential in supporting environmental and sustainability objectives.(8) The electronic industry faces problems with environmental sustainability, including resource depletion, hazardous materials management, and electronic waste (e-waste) disposal.(9). Addressing these challenges is crucial for sustainable development and corporate social responsibility.

Consumers are increasingly drawn to brands that not only match their social status but also reflect

their values, including environmental responsibility. Social pressures from peers and media, known as subjective norms, significantly influence consumer choices, particularly when it comes to purchasing green products. This influence underscores the growing importance of brand reputation and societal perceptions in shaping sustainable consumer behaviour.(12). Gen Z, in today's world demonstrates a strong preference for brands and products that align with their values, including sustainability. Their proactive stance towards environmental and social issues is reshaping consumer expectations and driving businesses to integrate sustainability into their core strategies."(8). Gen Z's attitude toward sustainability is influencing consumer behaviour and pushing industries, to prioritize sustainable practices in response to evolving consumer preferences.

Currently, according to the Environmental Performance Index, Europe is the leader in promoting green marketing—with Denmark, Great Britain and Finland leading the way((9) A 2019 survey by McKinsey & Company [45] showed that 66% of consumers, including 75% of Millennials, said that they pay attention to sustainability when shopping. According to a Lending Tree Group's (10) survey of 1048 Americans, 55% of them are willing to spend more on sustainable and green products. Over the past five years, a global analysis conducted by the Economist Intelligence Unit (11) for the World Wildlife Fund, encompassing 54 countries, revealed a 71% rise in international online searches for sustainable products. The popularity of environmentally friendly products has surged, particularly in high-income countries such as the US, where searches for sustainable products on Google soared by an astonishing 450% from 2016 to 2018. This trend is also noticeable in developing nations.

Thakur and Gupta (13)highlighted that promotional incentives offered by online retailers play a pivotal role in shaping consumers' pro-environmental attitudes. They emphasized that these incentives are key factors influencing how consumers perceive and engage with environmentally

friendly behaviours and products online. This recognition underscores the significant impact of marketing strategies and promotional efforts by online retailers in fostering a pro-environmental mindset among consumers. Previous research indicates that consumers' attitudes toward purchasing environmentally friendly products online are shaped by several factors. These include the reputation of the brand, the convenience and pricing of the products(14), alignment with lifestyle and personal values(15), (16), and the influence of subjective norms(17), (18) such as social pressures and media endorsements. These elements collectively impact how consumers perceive and prioritize sustainability when making online purchasing decisions.

In recent years, survey done by Mckinsey (19) has shown that younger consumers are increasingly placing importance on sustainability factors when they decide to make purchases. This shift in consumer behavior is not just a matter of verbal acknowledgment; in the United States, products that advertise their sustainability benefits have been selling better than those that do not make such claims. This trend indicates a tangible preference among consumers for products that align with their environmental values and preferences.

While young consumers continue to express concern for sustainability, recent economic uncertainties and inflation have prompted them to make more deliberate trade-offs. In both Europe and the United States, a smaller proportion of Generation Z and millennial consumers regarded sustainability claims as a decisive factor in their purchasing decisions at the start of 2024 compared to 2023.

Generation Z in India actively engages in the country's development narrative by favoring indigenous brands that align with their core values and aspirations. They prioritize supporting home-grown enterprises that uphold the principles and ideals they admire.(20). Indian Generation Z desires marketers to see them as more than just digital natives. They want recognition that extends beyond their media consumption habits to encom-

pass their self-perception and identity.(21)

Overall, millennials' preference for sustainability in purchasing especially in India reflects their values, concerns for the environment and future generations, and desire to support brands that align with their ethical and environmental principles.

Objectives of the Study

1. To assess the awareness levels of Generation Z in India regarding environmental and sustainability issues related to electronic products.
2. To list out the factors influencing Generation Z's purchasing decisions when buying electronic products in India.
3. To investigate the extent to which sustainability considerations impact the purchasing behavior of Generation Z consumers in the Indian electronics market.
4. To explore the role of the electronics industry in promoting sustainability initiatives and practices in India.

Methodology

An online survey was conducted to explore the awareness level of Generation Z in India, targeting consumers aged 12-27. A questionnaire, with a predetermined sample size was employed. The survey included participants from across India, encompassing various age groups, income levels, genders and education levels out of which 105 responses were considered.

A secondary research of the available literature helped in identifying the bases for developing the questionnaire for the survey. The respondents were drawn from the age group between twelve to twenty seven years and are considered to belong to Generation Z (IIIII) by the snowball sample method

Data was gathered through various question formats including Multiple Choice Questions (MCQs), Checkboxes, and open-ended questions. The questionnaire was designed to assess respondents across the following aspects:

- I. Demographic Information
- II. Awareness of Sustainability Issues in Electronics
- III. Impact of Sustainability on Purchasing Decisions
- IV. Influence of Factors on Purchasing Decisions
- V. General Attitudes Towards Sustainability

The aforementioned factors were examined concerning the age, gender, and education levels of Gen Z. The questions have been abbreviated (A1-A17) for easier reference. The questions pertain to the dimensions mentioned above in the following manner:

- ◆ Questions A1-A5 check Demographic information about the respondent
- ◆ Questions A6-A10 for knowing the awareness level of sustainability issues in Electronics
- ◆ Questions A11- A13 talks about the Impact of Sustainability on Purchasing Decisions
- ◆ Questions A14- A15 discusses about Influence of Factors on Purchasing Decisions
- ◆ Questions A16- A17 talks about the General attitude of Gen Z towards sustainability

	Questionnaire
A1	Age
A2	Gender
A3	Residence
A4	Level of Education
A5	Which of the following ranges best represents the total annual income of your household ?
A6	How familiar are you with the concept of sustainability in electronics?
A7	What does sustainability in electronics mean to you?
A8	Have you heard of e-waste?
A9	Are you aware of any environmental regulations or initiatives related to electronics in India (e.g., e-waste management rules)?

A10	Do you consider sustainability factors (e.g., energy efficiency, recyclability) when purchasing electronic devices?
A11	How important are sustainability considerations (e.g., environmental impact, ethical practices) when buying electronics?
A12	Have you ever chosen one electronic product over another because of its sustainability features?
A13	What specific sustainability features do you look for when purchasing electronics? (Select all that apply)
A14	Which of the following factor/factors influence on your purchasing decision
A15	How likely are you to pay a premium for electronics that are more sustainable?
A16	Do you believe that businesses have a responsibility to produce electronics in a sustainable manner?
A17	What do you think could be done to improve sustainability practices in the electronics industry in India?

To quantify the user response data for data analysis, the following adjustments have been made: Wherever, the user response has been ‘yes’, it is considered as 1 and wherever if is ‘No’, it is considered 0.

In case of a response, the following was concerned for analysis of preferences by the respondents:

- ◆ ‘Maybe’ (i.e. where user was slightly doubtful) it is taken as 0.5.
- ◆ For variables A6, A11, A15 and A16 the range varies between 1-4.
- ◆ For variable A6, 4 means that the respondent is very familiar with the concept of sustainability and 1 means the respondent is not familiar at all.
- ◆ For variable A11, 4 means Sustainability is not at all considered while purchasing electronic products and 1 means sustainability is a very important factor while purchasing.
- ◆ For variable A15, 4 means the respondent is not likely to pay a premium for sustainable electronics whereas 1 means the respondent is very likely to pay a premium for sustainable consideration in electronics.

- ◆ For variable A16, 4 means the respondent strongly disagrees in believing that businesses have a responsibility to produce electronics sustainably whereas 1 means it is the responsibility of the business to produce electronics sustainably.

Three kinds of analyses were used in the study.

- ◆ Skewness was initially used to understand how the Gen Z trends are in the Indian market.
- ◆ Pearson Correlation was used to understand any relation between the observed patterns to validate the results.
- ◆ Standard Deviation

Data and Sources of Data

Secondary data was gathered from diverse published sources and websites, while primary data was obtained from a representative sample selected based on the age group. In this study, a sample size of 150 respondents was chosen for the questionnaire. India is home to an estimated 116 million Gen Z consumers. In fact, two out of every five urban Indian consumers between the ages of 15 and 55 belong to the Gen Z demographic.(21). So, we ensured that the respondents for the questionnaire were majorly from this segment. Out of 150 respondents we considered 105 respondents due to the data insufficiency in 45 respondents. Our major respondents were in the age bracket of 20-24 years and we got almost equal percentages of male and female responses. Our respondents were majorly urban Gen Z with an equal number of post-graduates and Undergraduates as they will be more aware of the concept of sustainability.

Skewness

The research initially aimed to investigate the extent of all dimensions (A6- A10 dimensions related to awareness, sustainability, and electronic products discussed earlier) within the sample.

Skewness measures the lack of symmetry in a

distribution. A distribution is symmetric if it looks the same to the left and right of the center point (mean). Positive skewness indicates that the distribution has a longer or fatter tail on the right side, whereas negative skewness indicates a longer or fatter tail on the left side of the distribution. Skewness in research on the Awareness level enhances the understanding of behaviour distributions, supports segmentation strategies, informs predictive analytics, guides decision-making, facilitates comparative analysis, and ensures the statistical integrity of research outcomes.

Question	Standard Deviation	Skewness
A1	16.52502431	1.462806747
A2	28.00744	0
A3	38.24469	1.764139
A4	24.00081	0.98877
A5	17.29789417	1.93666495
A6	12.95597	0.514001
A7	23.80024009	2.605700985
A8	29.57953	2.789372
A9	18.40149	0.490227
A10	16.13891088	2.047259174
A11	18.22511	0.454495
A12	17.68114	0.220754
A15	12.63813	1.119466
A16	15.81757	1.536366
A17	17.29789417	1.93666495

Interpretation of results:

For A1-A5 variable, which determines the demographic levels of the respondents shows an average of 1.053928892 shows skewness greater than 1 showing the data distribution is highly skewed.

For A6-A10, the average skewness level is 1.68931207 which shows more awareness of sustainability in Gen Z in India. Also sometimes youngsters consider sustainability factors while purchasing electronic products. For A11-A13, sustainability considerations are very important, especially product features, price, and brand reputation.

For A14-A15 the average skewness level is 0.670109965 which means distribution of the data is moderately positively skewed. For A16-A17 the average skewness level is 1.736515443, indicates a highly positively skewed distribution, where the majority of data points are on the lower end of the scale with a few extreme values pulling the distribution to the right which tells us that Gen Z believe that businesses also have responsibility towards sustainability.

Pearson Correlation

Pearson correlation is a measure of the linear relationship between two continuous variables.

It quantifies the strength and direction of the association between two variables, indicating how much one variable changes when the other variable changes linearly. Correlation Coefficient is calculated as follows:

$$\rho = \text{cov} (A_n, A_9) / \sigma_{A_n} \sigma_{A_9} \text{ where } \text{cov} (A_n, A_9) = E[(A_n - \mu_{A_n})(A_9 - \mu_{A_9})] \text{ where } E \text{ is the expectation}$$

ρ varies between -1 to +1. A correlation value approaching 1 indicates a strong positive or negative relationship, where the variables tend to increase or decrease together. If the value trends towards -1, they are negatively correlated.

Variables Used for Correlation	ρ	What to Determine	Findings
A1, A10	0.619034999	To check whether the user’s awareness of Sustainability is related to his/ her age.	The value shows a positive correlation tending more towards 1 and hence we can conclude that greater awareness levels among users in Gen Z
A2, A10	1	To check if Gender has a role in purchasing sustainable products	The value shows a positive correlation tending more towards 1 and hence we can conclude that gender also impacts purchasing decision
A3, A10	-1	Urban/ Rural	The value is negative and closer to zero which shows a lesser relation between both the variables
A4, A10	0.80725218	Level of Education	The value shows a positive correlation tending more towards 1 and hence we can conclude that education has positive outcome towards sustainability
A5, A10	-0.16216237	Income Level	The value is negative and closer to zero which shows a lesser relation between Income & Sustainability
A6, A10	-0.45968934	Knowledge of the concept of sustainability	The value is negative and closer to zero which implies that lower levels of knowledge result in less influence on sustainable purchasing decisions.
A9, A10	0.99999618	Knowledge of Sustainability regulations	The value is negative and closer to zero which means that lesser understanding of regulation result in less purchase of sustainable products
A12, A10	-0.50375465	Chosen product due to sustainability	The value is negative and closer to zero which shows a lesser relation between both the variables
A16, A10	-0.94354727	Businesses have a responsibility in sustainability	The value is negative and closer to zero which implies businesses should focus on sustainability

Summary of Findings

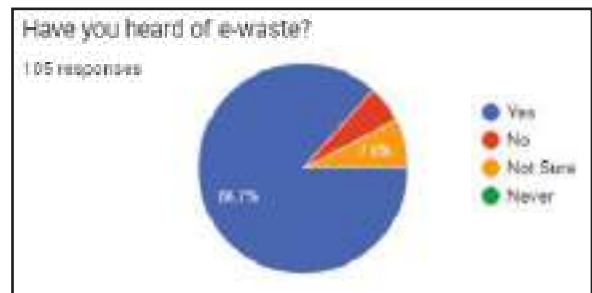
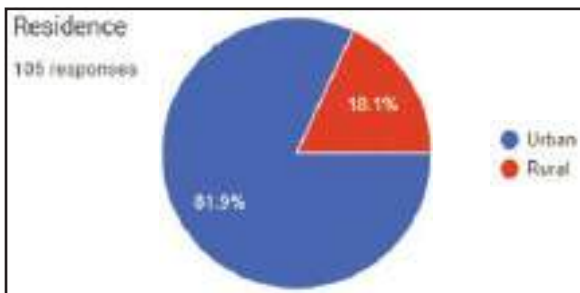
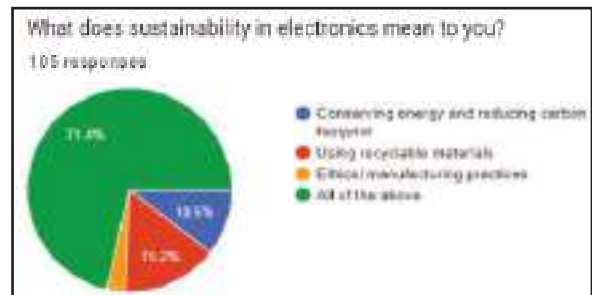
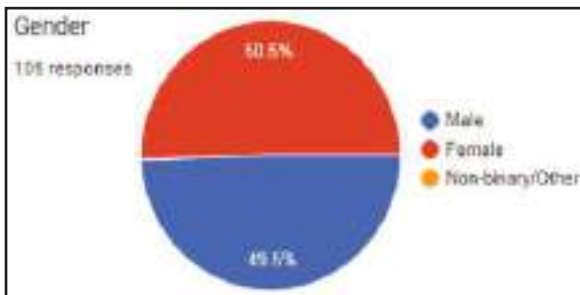
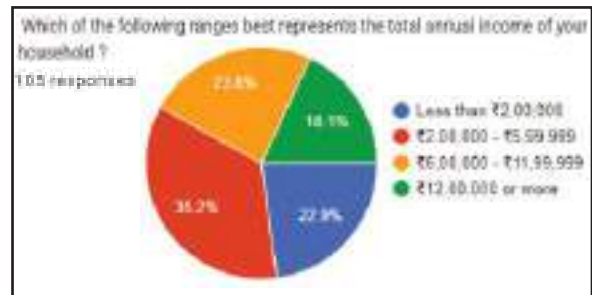
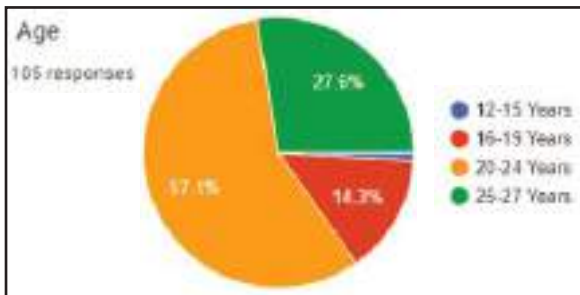
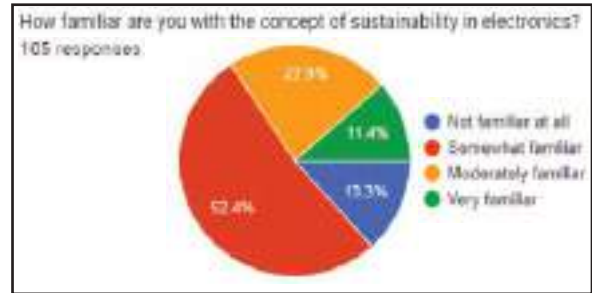
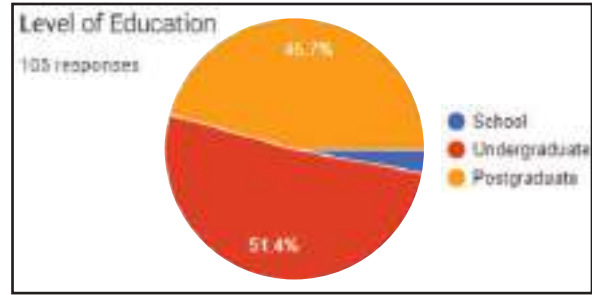
We see considerable awareness levels and purchasing behaviors of Generation Z (Gen Z) in India regarding sustainability in electron-

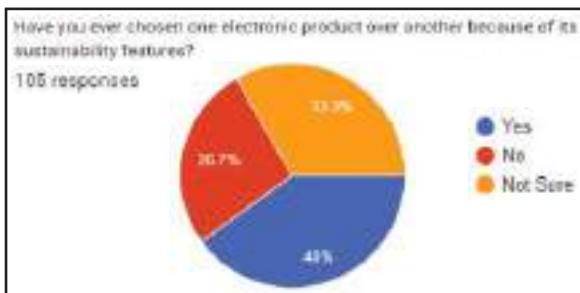
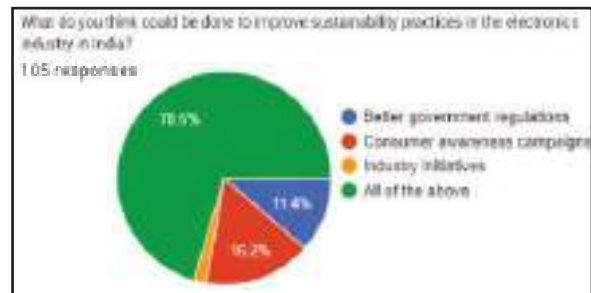
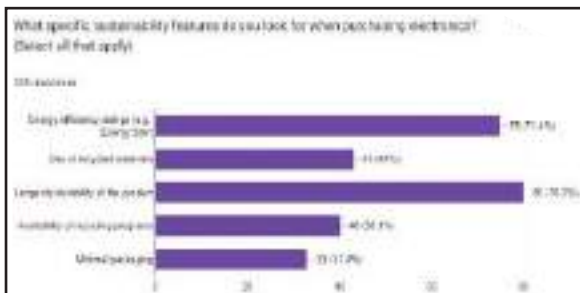
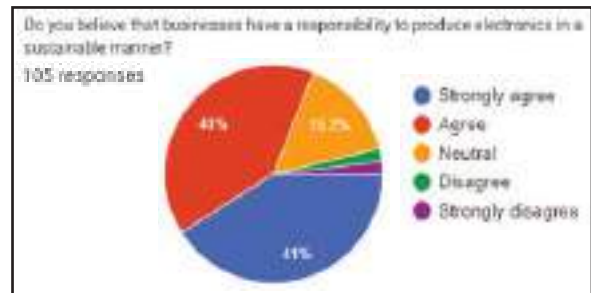
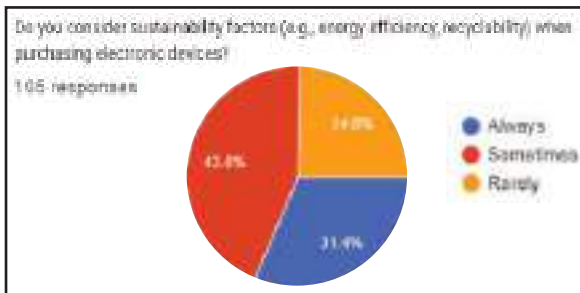
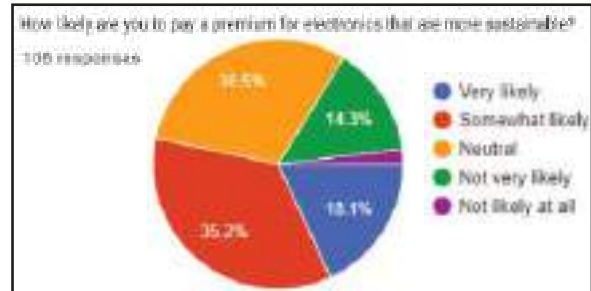
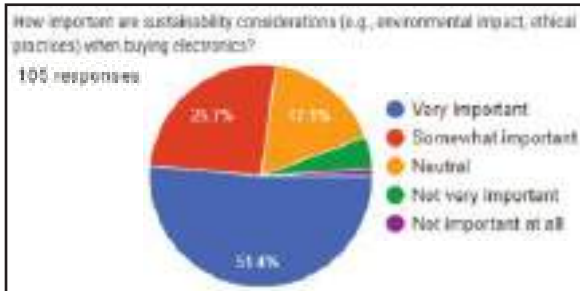
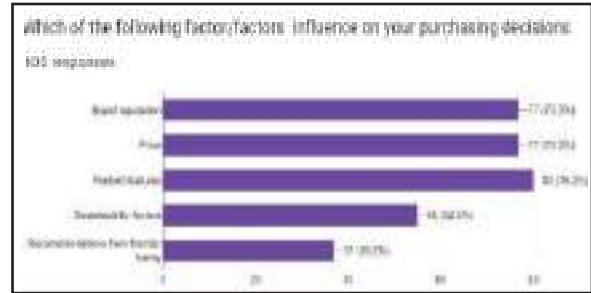
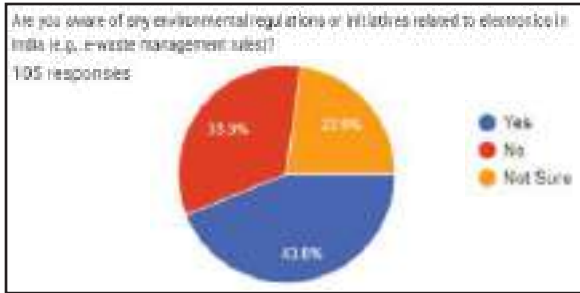
ics. A significant portion of Gen Z in India demonstrates varying levels of awareness regarding sustainability issues related to electronic products. While some respondents show a strong understanding of concepts like e-waste

and energy efficiency, others exhibit limited awareness.

Sustainability considerations play a notable role in the purchasing decisions of Gen Z consumers. Factors such as environmental impact, recyclability, and ethical practices influence their choices when buying electronic devices. A considerable percentage of respondents have indicated a willingness to pay a premium for products perceived as more sustainable.

The study suggests a positive correlation between awareness levels and the impact of sustainability on purchasing decisions. Respondents with higher awareness tend to prioritize sustainability factors more strongly compared to those with lower levels of knowledge in this area.





Conclusion

Gen Z in India shows a varied but growing awareness of sustainability issues related to electronic products. While there is considerable knowledge about concepts like e-waste management and energy efficiency, gaps exist that need to be addressed through targeted education and awareness campaigns.

Considerations such as environmental impact, recyclability, and ethical practices significantly influence their preferences when selecting electronic devices. The willingness to pay a premium for products perceived as more sustainable underscores the importance of integrating sustainability into product offerings. Improving knowledge levels can empower consumers to make more informed and environmentally responsible choices.

Businesses in the electronics sector have an opportunity to capitalize on the growing demand for sustainable products among Gen Z consumers. By incorporating sustainability into their product development strategies and marketing campaigns, companies can not only meet consumer expectations but also contribute positively to environmental goals.

Policymakers play a crucial role in fostering a sustainable consumer culture. Policy interventions should focus on incentivizing sustainable practices, promoting eco-labeling, and enforcing regulations that encourage responsible production and consumption of electronics.

In conclusion, while there are encouraging signs of sustainability awareness and influence on purchasing decisions among Gen Z in India, concerted efforts are needed from businesses, educators, and policymakers to further cultivate a sustainable mindset. Addressing knowledge gaps and aligning consumer behaviors with environmental goals will be essential in shaping a more sustainable future for the electronics industry in India.

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ASSESSING HOW FINANCIAL STATEMENTS AND CSR INTER-REACT IN PHARMACEUTICAL COMPANIES

Prof. Sangeetha S Kumar & Srushti D S*

Abstract

This research assesses the relationship that exists between financial statements and corporate social responsibility (CSR) in pharmaceutical companies, with a special emphasis on the legal requirements and duties that govern CSR operations. Regulations sometimes require CSR expenditures, mandating businesses to devote a percentage of their profits to social and environmental activities, in light of the pharmaceutical industry's crucial role in public health.

A thorough analysis of the literature looks at different viewpoints on how CSR and financial performance are related. The methodology involves data analysis from three top pharmaceutical firms utilizing the Statistical Package for the Social Sciences (SPSS). To determine the links between financial performance indicators and CSR spending, correlation analysis is done using SPSS. The links are then interpreted using Structural Equation Modeling (SEM), which sheds light on the effects of financial results on CSR initiatives and tax savings. The effect of CSR spending on net profit, EBITA, and tax expenses for the chosen firms is shown via data analysis. Both positive and negative correlations are highlighted in the interpretation of the data.

CSR and leadership go hand in hand because strong leaders include Sustainability into their main plans, which promotes environmental responsibility and moral business conduct.

The results of the study can assist company managers in making strategic choices that will guarantee that their corporate goals and financial resources are complemented by their CSR activities.”

Keywords : *Pharmaceutical firms, Financial statements, Corporate social responsibility (CSR), Statistical Package for the Social Sciences (SPSS), Correlations.*

Introduction

The relationship between CSR and financial statements is significant in the pharmaceutical industry. The pharmaceutical industry works in a highly scrutinized industry where social effects and ethical issues are crucial. Due to the industry's vital role in public health and safety, profitability indicators including net profit and EBITA are extensively examined. In this industry, corporate social responsibility (CSR) endeavors typically center around health-related projects, disease discovery and treatment, and enhancing medication accessi-

bility. Consequently, financial support for CSR is not only mandated by regulations but also serves as an important strategic priority that is consistent with these businesses' primary goals.

Corporate Social Responsibility (CSR) and leadership are closely related because the vision and dedication of an organization's leaders have a major role in the execution and success of CSR programs. Integrating CSR into a company's fundamental strategy and culture is mostly dependent on its leadership. Known executives understand that corporate social

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responsibility (CSR) is a strategic need that may accelerate long-term value generation. They encourage and inspire workers to adopt socially conscious behaviors, building a climate of morality and sustainability. Additionally, leaders set an example for others by acting and making decisions that reflect their commitment to CSR. A company's reputation may be improved, stakeholder trust may be developed, and a competitive edge can be produced by this leadership and CSR alignment.

As a way for a firm to demonstrate its commitment to ethical business practices and sustainable development, corporate social responsibility, or CSR, has become an essential part of corporate governance. In its broadest sense, corporate social responsibility (CSR) is the obligation of companies to make beneficial contributions to the community and the environment in addition to their financial operations. It covers an extensive array of activities, ranging from charity and responsible labor standards to community involvement and environmental sustainability. CSR ensures that corporations take an active part in tackling issues affecting society and the environment. It is not only a voluntary activity; in many countries, like India, it is required by law for certain enterprises under specified conditions.

In India, "Section 135 of the Companies Act 2013" mandates that businesses engage in CSR initiatives. According to this clause, businesses that satisfy specific financial requirements have to set aside a percentage of their earnings for corporate social responsibility programs. In particular, businesses must dedicate "at least 2% of their average net earnings from the previous three fiscal years to corporate social responsibility (CSR) initiatives if they have a net worth of ₹500 crore or more, a turnover of ₹1,000 crore or more, or a net profit of ₹5 crore or more." This legal requirement emphasizes how crucial it is for qualifying firms to include CSR in their fundamental operational and strategic frameworks to promote a culture of social responsibility and corporate accountability. (Suveera Satyajeet Patil, 2024)

An organization's CSR responsibilities are mostly determined by its financial accounts. Net profit, tax expenses, and Earnings Before Interest, Taxes, and Amortization (EBITA) are some of the important financial measures that are connected to CSR compliance. These financial statement components are crucial for determining the necessary CSR expenditure as well as for evaluating the financial health of an organization. For CSR purposes, net profit—a key measure of a business's profitability—is determined before tax deductions by Section 198 of the Companies Act of 2013. This amount is used as the starting point to calculate the required 2% CSR expenditure. The net profit metric, which does not include tax deductions, guarantees that the computation accurately represents the company's earning potential and defines the CSR requirements among different sectors.

Profits Before Interest, Taxes, and Amortization, or EBITA, is another important financial indicator that is frequently brought up about corporate social responsibility. While EBITA does not directly determine CSR expenditure, by emphasizing earnings from core business operations, it offers a more accurate view of an organization's operational efficiency. Determining a company's effectiveness in generating profits before deducting capital expenditures and non-operating costs is made easier for stakeholders when they comprehend EBITA, which in turn influences CSR capacities and plans. Additionally, there is a big overlap between tax expenditures and CSR factors. Because pre-tax net profit was utilized for the CSR computation, it adheres to the more general rule that tax planning should not reduce an organization's commitment to social responsibility. This strategy makes sure businesses, regardless of their tax obligations, give a reasonable portion of their income to further society's growth. Tax incentives and laws can also occasionally have an impact on corporate social responsibility (CSR) initiatives. They might do this by offering tax breaks for certain social ventures or by influencing the financial environment in which CSR initiatives are conceived and carried out.

Literature Review

The impact of social responsibility on corporate financial performance: A systematic literature review – by Rui Coelho and Shital Jayantilal and Joao J. Ferreira, 2023

The systematic literature review examined 53 publications from 1984 to 2021 and concluded that, as companies' ESG scores rise, CSR initiatives directly and significantly affect their financial success. Strong ESG ratings are positively correlated with financial performance for businesses, and improved financial results are also linked to the integration of CSR into strategic planning.

“Analysis of the Relationship Between CSR and Financial Performance: Evidence From India by Nayana and Haresh, 2022.”

After five years of data analysis from the top 25 Indian companies, the scholars discovered a statistically significant positive link between CSR initiatives and financial metrics like net profits and net sales, showing advantages to profitability and revenue growth. They did find a statistically insignificant negative association, nevertheless, between CSR and return on capital employed, indicating that there is no direct effect on capital efficiency. The intricate link between corporate social responsibility (CSR) and financial performance is emphasized in this study, underscoring the need for more research on industry-specific variables and the processes via which CSR affects different financial measures.

From Giving Back to Getting Ahead: The Surprising Link Between Corporate Social Responsibility and Firm Financial Performance of India's Top Pharmaceutical Companies by Eldho Babu and Dr. N. Maria Joseph

Using data from a wide range of research, the study examines the complex link between financial success and corporate social responsibility (CSR). It draws attention to the many facets of corporate social responsibility (CSR) and how it

affects financial results, stakeholder involvement, and company reputation. The research looks at the quantitative components of this relationship using statistical techniques like regression and correlation. Data on CSR donations and the average net profits of Indian pharmaceutical businesses over several years, for instance, are shown. This quantitative method offers insightful information on the statistical importance of corporate social responsibility (CSR) practices on financial performance.

“Impact of CSR on financial performance by Bhakti Naik, 2020”

The study delves into how corporate social responsibility, or CSR, affects financial performance and finds that CSR activities and profitability are closely linked. According to the research, companies with better CSR ratings typically generate greater revenue from their assets, which raises their return on equity (ROE) and return on assets (ROA). The study emphasizes how important corporate social responsibility (CSR) is to improving shareholder value and overall business success. It also provides insightful information for future research on the relationship between CSR and financial results.

“Impact of Corporate Social Responsibility on Financial Performance: A Comprehensive Analysis of Indian Firms by Bikrant Kesari and Nimisha Rawat, 2023”

This study examines the correlation between Financial Performance Indicators and Corporate Social Responsibility (CSR) in fifteen organizations from 2017 to 2021. It reveals a statistically significant positive link between CSR expenditure and profit before tax (PBT) using regression modeling and correlation analysis, underscoring the possible financial advantages of CSR. On the liquid ratio (LR), CSR expenditure, however, has little explanatory power, suggesting that other factors may have an impact on this measure.

“The Relationship between Corporate Social Responsibility and Financial Performance: A Literature Review by T. Gi Gia, A. Vakilbashi, and N. A. Mohd Zamil, 2015”

A diverse landscape of findings and viewpoints is shown by the literature study on the link between financial success and corporate social responsibility (CSR). Research shows that reputation, customer satisfaction, and competitive advantage play mediating roles in the relationship between corporate social responsibility and financial performance, especially in the industrial and consumer sectors. There are conflicting findings in the literature; whilst several studies suggest a favorable link, others find no meaningful association. The significance of reporting methods, corporate attributes, and industry context highlights the necessity for a comprehensive grasp of how CSR policies affect financial results. This assessment highlights the ongoing discussion and the need for more investigation to clarify the reasons behind the association between CSR and financial performance.

“A study on impact of CSR on Financial performance of companies in India with respect to FMCG and Pharmaceutical Sector by Ms.Abilasha N, Dr. Madhu Tyagi,”

The business sector has given corporate social responsibility (CSR) a lot of attention, especially in India's FMCG and pharmaceutical industries. In a research published in 2018, the research investigated how corporate social responsibility (CSR) affected these industries' bottom lines between 2008–2009 and 2018–19. According to the study, businesses are putting more of an emphasis on fulfilling the Companies Act of 2013's requirement that they donate a set amount of their income to CSR initiatives. The pharmaceutical industry displays inconsistent outcomes, with differing degrees of association between CSR and financial indicators, but the FMCG sector demonstrates a notable shift in financial variables following CSR implementation. To improve reputation, profitability, and community development, the study emphasizes how crucial it is to include CSR in long-term company plans.

“Demystifying relationship between Corporate Social Responsibility (CSR) and Financial Performance: An Indian Business Perspective by Dr.Richa Gautam, Dr.Anju Singh, Dr. Debraj Bhowmick, 2016”

The research reveals a trend in which stakeholder pressure and performance indicators drive the adoption of CSR as an efficient company approach, leading to the integration of business and CSR initiatives. Through an analysis of 245 Indian firms' financial performance data and CSR declarations, the study highlights the growing importance of CSR integration in attaining organizational success. This innovative study provides insightful information for Indian businesses looking to use CSR activities to fill gaps and grab advantages in the highly competitive commercial environment.

“The Controversial Link between CSR and Financial Performance: The Mediating Role of Green Innovation by Saeid Homayoun, Bitu Mashayekhi, Amin Jahangard, Milad Samavat, and Zabihollah Rezaee, 2023”

The study explores the intricate relationship that exists between CFP and CSR, concentrating on the role that green innovation performance (GIP) plays as a mediating factor. Based on thorough multivariate analysis and robustness testing, the research validates the noteworthy and favorable impacts of both CSR and GIP on CFP. This study contributes to the existing body of information by highlighting the critical role that green innovation plays in clarifying the relationship between financial success and corporate social responsibility.

Methodology

◆ Data Collection about CSR:

The most recent annual reports of Lupin, Sun Pharma, and Cipla are being fetched. Data from the sustainability or CSR sections are being extracted to gather information about their CSR spending and activities. Each company's CSR spending data over the same fiscal period is being compiled to ensure a comprehensive view of their contributions.

◆ Gathering of Financial Data:

To find the financial statements of Cipla, Sun Pharma, and Lupin, data is being browsed from an open internet source. Information is being taken from the same fiscal year's net profit, EBITA, and tax expenses as the CSR data to maintain uniformity.

◆ Data Analysis:

“Applying statistical approaches with SPSS software is required to analyze the relationship between CSR and finances. A comprehensive tool for arranging and analyzing data, the “Statistical Package for the Social Sciences (SPSS)” can handle a large range of statistical models and tests.”

◆ Hypothesis Building:

1. First Hypothesis -

H0: There is a negative relationship between financial performance (net profit and EBITA) and CSR.

H1: There is a positive relationship between financial performance (net profit and EBITA) and CSR.

“Conduct a correlation analysis using SPSS to determine the relationship between the financial performance indicators and CSR expenditures.”

2. Second Hypothesis-

H0: Companies performing CSR activities have higher Tax expenses.

H1: Companies performing CSR activities have comparatively lower Tax expenses.

“Use SPSS to conduct a correlation analysis specifically between CSR expenditures and tax expenses.”

◆ The SPSS procedure is as follows:

Net profit, EBITA, Tax expenses, and CSR expenditures are the variables that are being collected and put into SPSS, and each one is clearly stated. To test the hypotheses, use the

'Correlation' tool found in the 'Analyze' menu. Taking into account net profit, EBITA, and tax costs as independent variables and CSR spending as the dependent variable, correlations are being assessed.

◆ Interpretation

The structural equation modeling (SEM) is being utilized to analyze the correlation analysis results. SEM is an extensive statistical method that enables the evaluation of intricate correlations between variables, encompassing both direct and indirect impacts. The interpretation would be made by creating an SEM model with net profit, EBITA, Tax costs, and CSR spending as the independent and dependent variables.

In short, The research uses data from **Cipla, Sun Pharma, and Lupin** to examine the relationship between financial performance and CSR activities. An analysis is conducted on the financial statistics and CSR spending for the fiscal years **2020–2021, 2021–2022, and 2022–2023**. In contrast to CSR data, which is obtained from the firms' annual reports, financial performance measurements, such as net profit, EBITA, and Tax expenses, are taken from accessible online sources. Using SPSS software, correlation tests are carried out to evaluate the hypotheses.

Data Analysis And Interpretation

DATA:-

CIPLA				
YEAR	CSR (Cr)	NET PROFIT (NP)(Cr)	EBITA(Cr)	TAX EXPENSES(Cr)
2022-2023	65.1	4220.77	23,228.57	1202.86
2021-2022	55.76	3675.39	22,044.25	933.8
2020-2021	45.27	3290.06	19,425.58	888.76

Source: financial data from the “money control” website. CSR data from the annual reports of the company,

Correlation Analysis:-

1. CSR and Net Profit (NP), EBITA.

Correlations				
		CSR	NP	EBITA
CSR	Person Correlation	1	.991	.984
	Sig. (2 tailed)		.084	.115
	N	3	3	3

2. CSR and Tax Expenses

Correlations			
		CSR	TAX
CSR	Person Correlation	1	.991
	Sig. (2 tailed)		.270
	N	3	3

Interpretation

- ◆ The correlation between CSR expenditure and the Net profit of Cipla is: 0.991.
- ◆ The correlation between CSR expenditure and the EBITA of Cipla is: 0.984.
- ◆ The correlation between CSR expenditure and the Tax Expenses of Cipla is: 0.911.

LUPIN				
YEAR	CSR (Cr)	NET PROFIT (NP)(Cr)	EBITA(Cr)	TAX EX-PENSES(Cr)
2022-2023	35.65	527.14	11,350.09	101.93
2021-2022	33.99	-161.53	11,922.09	27.17
2020-2021	27.34	1629.7	11,185.02	371.08

Source:

financial data from the “money control” website. CSR data from the annual reports of the company,

Correlation Analysis

1. CSR and Net Profit (NP), EBITA.

Correlations				
		CSR	NP	EBITA
CSR	Person Correlation	1	.836	.522
	Sig. (2 tailed)		.370	.651
	N	3	3	3

2. CSR and Tax Expenses.

Correlations			
		CSR	TAX
CSR	Person Correlation	1	.922
	Sig. (2 tailed)		.253
	N	3	3

Interpretation

- ◆ The correlation between CSR expenditure and the Net profit of Lupin is: -0.836.
- ◆ The correlation between CSR expenditure and the EBITA of Lupin is: 0.522.
- ◆ The correlation between CSR expenditure and the Tax Expenses of Lupin is: -0.922.

SUN PHARMA				
YEAR	CSR (Cr)	NET PROFIT (NP)(Cr)	EBITA(Cr)	TAX EX-PENSES(Cr)
2022-2023	85.365	4678.84	21,091.17	50.33
2021-2022	45.792	2127.39	16,543.90	406.85
2020-2021	57.559	2242.43	12,953.43	13.17

Source:

financial data from the “money control” website. CSR data from the annual reports of the company,

Correlation Analysis:-

1. CSR and Net Profit (NP), EBITA.

Correlations				
		CSR	NP	EBITA
CSR	Person Correlation	1	.968	-.999*
	Sig. (2 tailed)		.162	.033
	N	3	3	3

2. CSR and Tax Expenses

Correlations			
		CSR	TAX
CSR	Person Correlation	1	-.668
	Sig. (2 tailed)		.534
	N	3	3

Interpretation

- ◆ The correlation between CSR expenditure and the Net profit of Sun Pharma is: 0.968

- ◆ The correlation between CSR expenditure and the EBITA of Sun Pharma is: -0.999.
- ◆ The correlation between CSR expenditure and the Tax Expenses of Sun Pharma is: -0.668.

Findings

Cipla: There is a high positive link between Net-Profit and CSR, meaning that as NetProfit rises, so do CSR activities. That being said, the correlation's significance level is 0.084, greater than the industry standard of 0.05. The data indicates a robust positive association between EBITA and CSR, indicating that greater EBITA is correlated with more CSR activities. This correlation's significance level is 0.115, which is higher than the 0.05 standard. The data reveals a robust positive association between tax costs and corporate social responsibility (CSR), suggesting that larger CSR activities are linked to higher tax expenses. With a significance level of 0.270, this link is significantly stronger than the 0.05 limit. Thus, it is possible that this result is not statistically significant at the 5% level.

Lupin: There is around a -0.836 Pearson correlation relationship between CSR and NetProfit. The high negative association indicated by this negative value suggests that CSR efforts tend to decline when Net Profit grows and vice versa. There is around a 0.522 Pearson correlation relationship between EBITA and CSR. The slightly positive association suggested by this positive value shows that CSR activities tend to rise in tandem with EBITA. There is around a -0.922 Pearson correlation relationship between tax costs and CSR. Given this substantial negative association, tax costs should be expected to decline as CSR activities rise. Stated differently, tax rates are often lower for enterprises with better CSR scores.

Sun Pharma: Between Corporate Social Responsibility (CSR) and Net Profit (NP), there is approximately a 0.162 Pearson correlation connection. As net profit increases, CSR activities tend to increase as well, according to the strong

positive connection shown by this positive number. The fact that the significance level (0.162) is higher than the usual cutoff point of 0.05 suggests that the result may not be statistically significant at the 5% tier. CSR and Earnings Before Interest Taxes and Amortization (EBITA) have a connection of around -0.668 according to Pearson. CSR efforts typically decrease in lockstep with EBITA, as seen by the significant negative correlation this negative figure suggests. This result is likely statistically significant at the 5% level since the significance level (0.033) is less than 0.05. The correlation between CSR and tax is around -0.668 according to Pearson. Tax expenses should decrease as CSR efforts increase, based on this strong negative correlation. In other words, companies with higher CSR rankings typically pay lower tax rates.

After analyzing the data and reviewing the majority of interpretations and findings, it is concluded that H1 is accepted for both hypotheses. H1 for the first hypothesis states there is a positive relationship between financial performance (net profit and EBITA) and CSR and that of the second hypothesis H1 states that companies performing CSR activities have comparatively lower tax expenses.

Discussion and Suggestion

The outcomes of the research highlight the important connections that exist between financial performance indicators and corporate social responsibility (CSR) initiatives in the pharmaceutical sector. CSR initiatives usually focus on health-related projects, illness research and treatment, and improving pharmaceutical accessibility because of the sector's vital role in the safety and health of the public. Positive connections between financial performance and CSR participation are supported by the correlations between higher net profits and EBITA across Cipla, Lupin, and Sun Pharma, which also show that these variables tend to strengthen CSR spending. Additionally, the research shows that businesses that actively participate in CSR programs usually experience lower

tax costs, which lends support to the hypothesis that CSR activity is associated with lower tax burdens. These insights emphasize how crucial leadership is in incorporating corporate social responsibility (CSR) into a business's core strategy and culture. Socially conscious actions may be encouraged by dedicated leaders, who can also foster an environment of sustainability and morality that improves the business's reputation among stakeholders.

Yet it's important to recognize this study's limitations. Because of the research's restricted emphasis on the pharmaceutical industry, its conclusions cannot be applied to other sectors of the economy. Furthermore, just three businesses' data were used in the investigation, which could not adequately represent the range of corporate practices throughout the industry. In addition, depending only on publicly accessible financial records raises the possibility of disparities arising from differences in reporting guidelines or precision of data.

By extending the scope to encompass a greater number of sectors and a bigger sample size of businesses, future studies might solve these constraints. By taking this method, the findings would be more robust and broadly applicable, offering a more thorough comprehension of the correlation between financial performance and corporate social responsibility in many industries. Using qualitative techniques, such as interacting with CSR managers and business executives, might provide a more in-depth understanding of the tactics and motives behind CSR initiatives. A greater awareness of CSR's role in accomplishing sustainable business practices would also be facilitated by long-term research that monitors changes in financial performance and CSR practices over time. These studies would provide insightful information about the sustainability and longer-term impacts of CSR investments.

Conclusion

In this study, the financial performance of the pharmaceutical sector was examined in connection to corporate social responsibility, or CSR. The results show that CSR expenditure is positively correlated with financial performance, as seen by the positive correlations found between CSR activities and financial key performance indicators like net profit and EBITA. Furthermore, a negative association suggests that businesses with active CSR initiatives may have reduced tax costs.

These findings highlight how important it is for leaders to include CSR in their organization's main business plan. A culture of sustainability and social responsibility is fostered by strong leadership, which eventually improves the company's standing among stakeholders. However, this study has drawbacks. The concentration on the pharmaceutical sector limits its applicability to other industries. The illustration of business practices is limited by the examination of only three businesses. Dependence on publicly accessible financial data also raises the possibility of discrepancies since different reporting standards are used.

By including other companies from different sectors, further studies can be improved. Qualitative approaches and long-term research can also offer a better knowledge of CSR activities and their effects. Businesses hoping to use corporate social responsibility (CSR) for social benefit and sustainable development might find this information useful.

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DIGITAL TRANSFORMATION: A FUTURE NEED**Prof. Sudhir A. Atwadkar & Umeshwari P. Patil***

Abstract

Changes in consumer behaviour and technological advancements have changed the entire business scenario and created new business challenges. The epidemic crisis brought new ideas to companies. Many organizations recognize and find new ways of doing business and reinventing their business strategies. IT plays an important role in digitalization and change, and no one is exempt from this. Digital transformation will rely on the company's unique resources and needs. In today's competitive business and digital age, digitalization and transformation have become important for all businesses. Companies need to adapt to the rapid changes brought by technology and establish a balance between customer needs and satisfaction. Digital transformation requires significant changes in organizational management and acceptance of technology. The success of a digital transformation initiative depends on understanding the context, decisions, context, and drivers. This article examines the context, setting, culture, and products of digitalization affecting organizations. This study is a comprehensive and comprehensive document showing the decisions, concepts, and effects of digitalization. Research demonstrates an understanding design, process, and traditional and digital techniques.

Keywords : *Digital, Technology, Strategy, Transformation and Success*

Introduction

Every industry has faced global technological changes in the past few years which creates huge opportunities such as better awareness, flexibility, and individualization with various challenges such as the changing environment and preferences of customers and businesses. From a strategic point of view – is a challenging situation for corporate. On one side digitalization creates the opportunities alleged but on the other side individuals are indefinite how-to usage and apply them instantaneously in terms of services. Various innovative business models are developed in the field of digitalization and these models influence corporate strategies. These business models are uncertain and explore opportunities.

The organization must adopt the rapid changes transported by the technological innovations in today's digital world. Digitalization become important to firms due to maintaining customer demand and satisfaction. To adopt the new approaches, process, and organizational framework firms must accept the transformation to embellishment in the technological era. The digital transformation is needs significant change in organizational management as well as technological acceptance. The major factors of digital transformation are Technology and Customers can be considered diverse. Technology initiatives denote advantages and their effect on society whereas customer initiatives represent the changing preferences and expectations of customers. Digitalization helps to understand these wants and enhances the performance and efficiency of the organization.

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Most of the recent studies highlighted on benefits of the technological aspects of digitalization and its need for organizational changes to adopt digitalization and respective strategies. With rapid changes in technologies and the commercial business environment, previous studies are inadequate to explain the complex phenomenon of digital transformation.

The present research paper focuses on digitalization and revolution, this work aims to explore how organization is influenced by digital transformation. How these drivers affect organizational framework, processes, and culture. It highlighted the role, impact, and challenges of digital transformation. It will help to answer the common question around digital transformation which provides clarity. With the consideration of secondary data, various articles are gathered from the internet and reviewed.

Digital Transformations:

Digitization is the procedure of translating statistics data into alphanumeric data which becomes a basis for the explanation of digital forecast of opportunities and it's called digitalization. Digital transformation is a combination of various advanced technologies that provide value in all aspects of a business enhance the culture and sustain in a competitive business environment to customers. It is used to reform organizations, financial prudence, and society at an organizational level. On social levels, digitalization is merging different technologies like big data, sensors, AI, and IoT which offers unexpected opportunities and provides imaginable products or services and new business models. These innovations create new bonds between firms or enhance relationships with customers and workers. Digital transformation has arisen as an essential concept for business experts and it is transforming the way to operate industrial organisations which is moving the industry towards digitalisation known as Industry 4.0. Digitalization is a very vast procedure and all technologies are components of the digitalization of organizations (Parida 2019 & Vial 2019)^{[1]-[2]}

The existing definitions highlight that the term digitalization is the practice of product and service along with digital features and business models whereas digital transformation has having very wide angle that includes the change required in the organization itself to match up with digitalization.

Hinings (2018) defined digital transformation as follows: 'By digital transformation, we mean the combined effects of several digital innovations bringing about novel actors (and actor constellations), structures, practices, values, and beliefs that change, threaten, replace or complement existing rules of the game within organizations, ecosystems, industries or fields.'^[3]

Parida (2019) explains that to develop business models and to generate new ventures for revenue various modern technologies are useful and create several openings which provide value to the industry^[1].

Digitalization is the procedure by which intentions to build and activate substantial changes in business practices by blending various modern digital technologies like information, communication, connectivity, and calculating.^[2]

The concept of digital transformation is dissimilar for every firm and difficult to identify a definition that is assigned to everywhere. In general - it is the integration of digital technologies but more than that, it is cultural changes that need firms to constantly maintain the standards. Jim Swanson, CIO of Johnson & Johnson said that 'Digital is a loaded word that means many things to many people.' Jay Ferro, CITO of Clario, recently explained that the problem is the origin of digital transformation and it clarifies the benefits, and self-improving achievements[4]. In the present era, researchers have explained that a vital part of digital communication is the generic and conceptual level and emphasized on 4 significant magnitudes – adoption and use of technology, creation of value, restructuring of framework, and financial facets. In the development of modern digital

strategies, these four aspects lead to the results for the company^[5].

Literature Review:

Still, there is much misunderstanding and confusion around the digital transformation as the transparent and systematic thought of idea. In the literature, no specific and universal classification of digital transformation. In many studies, on the basis of interest and proficiency in the area digital transformation is usually described. This consequence develops several definitions and it is hard to understand the concept for individuals and firms of this complex topic. In the past years, many companies and scholars falsely associated modern technologies and digitalization procedures due to different definitions and confusion in understanding the term digital transformation.

The high demand and use of digital technologies crossways different organizations have directed interest in the study of digital transformation (Vial 2019)^[2]. Komarčević (2017) emphasizes that digital transformation has a continued impact on various aspects of society, and there is a rising demand for a complete understanding of the concept of digitalization for better decision-making and policy^[6]. In 2008 Lankshear & Knobel clarified that digital applications facilitate inventions and inspiration to accomplish substantial transformation within the domain of information and expertise^[7]. Westerman (2014) and Bekkhus (2016) describe there are a bunch of applications and technological methodologies to enhance the effectiveness and performance of an organization and spread over^{[8]-[10]}.

Goran (2017) highlights that digital transformation is not only a combination of modern technologies and applications but includes more of it^[11]. Horlacher & Hess (2016), Tumbas (2017), João Catarino (2018), and Kutnjak (2019) highlighted the need of the organization stakeholders that digital transformation covers the complete redesign of organizational practices and policies for better performance and new inventions. By a clear understanding of digital transformation

organizations can accurately achieve their objectives^{[12]-[16]}.

Al-Ruithe (2018) and Vial (2019) emphasize that digital transformation raises improvements that influence humans everywhere and continuously organizations adopt the variations of the marketplace and customers through technological abilities to develop new organizational strategies and practices^{[17],[2]}. Bernard (2006) stresses that many firms have to reconsider their present policies while redesigning their business policies execution of extensive transformation stances is a significant challenge^[18]. Hence organizations must attempt to accept the technological advances new technologies continually to improve performance and longstanding survival (McKinsey, 2018). Battistoni (2023) and Bun (2021) highlight that digitalization is a practice which requires crucial variations equally to manufacturing and supportive activities to the organization. It also helps in gathering and investigating data which facilitates improvement areas of the organization^{[19]-[21]}. David Alvaro and Cynthia A. Challener, (2022). Golzer and Fritzsche (2017) make it clear that digital transformation is a continuous and complex process, and organizations need to be careful and adopt the right approach. The acceptance of digital technologies and data-driven approaches makes success in the digital era. Additionally, organizations need to understand the infrastructure, skills and processes required for digital transformation and be clear about the privacy and security of this information ^{[22]-[23]}. Chantias and Hess (2016), Pramanik (2016) and Trung (2021) argue that digital transformation units should be established separately to ensure control and privacy, thus ensuring continuity and clarity of digitalization strategies^{[24]-[26]}. Gehrke (2016) mentions the main nine challenges – an absence of concepts, methods, and tools for the digitalization process; conditions regarding migration are not clear; lack of structure and direction for change management; design; lack of coordination and cooperation; time and financial constraints have limited information; Lack of cultural support and lack of capacity which organizations will suffer in their digital transformation process^[27].

Culture and Digital Transformation:

The chief executive officer (CEO) leads the organization and the chief information officer (CIO) leads digital transformation efforts. CIOs with more responsibilities prove the successes to organizations not only through digital efforts but also with other IT functions. In recent eras, the role of IT (Chief Executive Officer - CEO) has shifted and they require help from the Chief Information Officer (CIO) to build revenue-related strategies for firms^[28]. They focus on business innovations rather than cost-cutting. This approach creates a rethink of the role and impact of information technologies in daily activities. According to the 2021 CIO Agenda report, 80% of CIOs are educating CEOs and other stakeholders on the importance of IT. This report highlighted that CEOs and CIOs are building stronger relationships and makes sense that technological driven firms are building a stronger digital economy^[28]. There is a different mindset when IT is in operating mode. However, creating innovation in organizations requires new skills. However, IT plays an important role in driving digital transformation and it is everyone's responsibility to implement and embrace these changes and digital transformation. As many organizations explore different work cultures, the digital journey begins with a campaign about reworking for everyone. Digital transformation measures realigning roles and functions. So digital transformation is not an organizational problem, it is a human problem^{[29]-[30]}.

Digital Transformation Drivers:

With the increase in the business competition environment, digitalization is important in modern business. Digitalization is not easy, but to support the long-term process, it is necessary to embrace digital transformation and re-create business policies that will support the success of the business. Several internal and external forces influence organizations to maintain success and improve performance. Understanding the diversity of digital transformations is very important in terms of the use of digital technologies and the realization of digitalization.

Technology is an essential and important element of digital transformation but more than that adoption, implementation, and legacy of digitalization are crucial^[31]. It is the process of change in business practices and operations according to digital trends and updated with current technology. Most of the industry adopting digital technologies to transform their organizations but few are struggling to cope with it. Some of the divers are discussed below to enhance of digital transformation process^[32].

i. Changing Nature of Customer:

Without the customer, there is no business and the customer is the king. Mobile and the internet make available everything to people and change their preferences. In this mobile-first era, customers prefer towards strong digital presence and easily find the information and availability of products and services. Therefore, it is necessary to be a customer and understand his expectations and preferences. This can only happen if organizations adopt a digital strategy.

ii. Data Analytics:

Bulky data is produced due to the changing nature of customers and the market environment. Gathering and investigating such data is a big task for any organization. Digitization is the solution to collect and analyze this information on demand and achieve competitive results. Businesses through using atomization processing tools convert unorganized data into organized information on one click and have a competitive advantage over others.

iii. Agility and Speed:

Digital transformation enhances and helps the organization become more alert and responsive by restructuring processes, interconnecting departments, and reducing manual work. The automation tools can simplify data access promote fast decision making and focus flexibility in communication.

iv. Cost Saving:

In today’s competitive world, every organization requires smart work rather than repetitive and manual. Digitalization helps employees to complete their critical and repetitive tasks quickly and get more time to focus on other tasks. By adopting digital technology organizations are taking benefits of transformation. To cut down on their expenditure and improve productivity may organization adopt digitalisation and enhance the success of the organisation.

v. Regulatory Compliance:

In data security and privacy, digital transformation can help businesses ensure to completion of all documentation maintain the records, and comply the compliance all legal and regulatory requirements.

vi. Talent Acquisition and Retention:

Today the expectations of employees are to be changed with the changing world. As organizations adopt modern technologies there is a need for skilled manpower. To maintain and attract the best skills and do the task efficiently organizations must embrace digital transformation and related strategies. It creates flexibility in work and key factor in attracting and retaining the best skills.

vii. Workflow Efficiency:

The changing nature of business and the increase in competition increase business complexities and work pressure. The organization needs innovative business decisions and models. Digital transformation can help the organization to offer technologies for employees to work effectively. These technologies line the tasks, faster decision making, and build interconnection among the departments resulting in more efficient workflows^[33]. One of the main benefits of digital transformation is providing cost savings and increased productivity by increasing business efficiency.

Considering the current need and pace of digital transformation, you must stay one step ahead if you want to stand out from the competition and survive in the market. In the current digital scenario, organizations are changing their business strategies and practices to keep up with the trend. The impression of digital transformation on organizations is in terms of business process optimization, competition, and business practices change, management structure change and management practices change^{[34]-[35]}. There is a necessity to invest in digital technologies and digital skill sets now and not a burden.

Essentials to Generate the Digital Transformation:

Organizations External Environment	Organisations Internal Environment
◆ Digital technology and technological progress	◆ Availability of resources.
◆ Digital Competition	◆ Digital Culture & Strategy.
◆ Changing Business Methodologies	◆ Innovative Business Models.
◆ Financing capacity.	◆ Improve Customer Satisfaction.
◆ Collaboration.	◆ Advance IT Infra.
◆ Pandemic crisis.	◆ Skillset and Efficiency.
	◆ Data-Driven decision-making.

Key Trends In Digital Transformation:

E.G. Nadhan noted that those firms that have many years of transformation journeys experience they have to make have had to make adjustments midstream. The pandemic causes firms to be ready for quaky movement in market-changing aspects and customer preferences. Onward-looking firms will focus on the skills and efficiency to effectively handle and accord with change with minimum influence on the internal and external environment^[5]. Stephanie Overby has mentioned that during the pandemic digitalization takes top priority. Digital transformation is crucial for future success and survival and many firms already take the speed of digital transformation.

. As E. G. Nadhan said there is a rise in attention to testing with limited constraints to forecast a firm's way of acting by using a similar environment and such practices will give more awareness into the ideal conformation that is most strong^[5]. Considering the views of these IT leaders, the key digital transformation trends -

- ◆ Focus on flexibility, persistence, and sustainability
- ◆ An emphasis on innovation through modern technology
- ◆ Business process automation
- ◆ Attention to data management and analytics
- ◆ Be mindful of the use of digital technology
- ◆ Preferences towards artificial intelligence & machine learning tools
- ◆ Security priority to business.

Conclusion:

In today's rapidly changing business world and intensifying competitive environment, many organizations are struggling to survive. Globalization and social and technological innovations are changing the nature of local government. After the epidemic, companies are being cautious and changing the way they do business. The pandemic has increased the need for digitalization and change, and companies must find other ways to run their businesses and survive. It is important to understand the importance of digitalization and its impact on the success of an organization's digital transformation. In the digital age, the role of leaders in creating the strategy and culture of the organization is very important and is an important part of digital transformation to respond to the competitive environment. By creating a culture and digital growth strategy, organizations can increase their profitability, better serve their customers, and survive. This study introduces the concepts of digitalization and change and the key elements of achieving digital transformation, which requires clear strategies and models to support an updated culture of creation. With clear guidance on digi-

tal transformation and corporate impact, management needs to accept digitalization and core ideas, as well as strategies and practices that use digital transformation and organization achieved through modern technology to create opportunities.

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A CONCEPTUAL MODEL FOR THE IMPLEMENTATION OF SUSTAINABLE FRUGAL INNOVATION IN BUSINESS: SYNTHESIZING THEORY AND PRACTICE

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Abstract

Frugal innovation offers cost-effective and simplified solutions tailored to the specific challenges faced by developing countries (Maliehe & Grobbelaar, 2022). It offers businesses a way to tackle environmental challenges while also growing financially. However, integrating sustainability principles into frugal innovation practices remains a difficult thing, requiring a nuanced understanding of the interplay between theory and practice. This study explores the factors and challenges involved in the successful implementation of frugal innovation ideas into product businesses, employing a qualitative research design with case studies and structured interviews. The research aims to identify the critical factors that influence the transformation of frugal innovation concepts into tangible products and the obstacles businesses encounter during this process.

The conceptual model developed for this study highlights two primary categories: 1) Factors concerning the entrepreneur and 2) Factors concerning local needs. Entrepreneurial factors include the background of the entrepreneur, observation, desire to innovate, creativity, vision, experience, technical skills, and a sustainable approach. Local needs factors encompass the identification of problems or needs, scarcity of resources, community participation, prototype and testing, collaboration, customer feedback, and continuous improvement.

The study identifies significant challenges in the frugal innovation process, such as resource constraints, lack of awareness, scepticism, lack of trust, and the durability of the product. By understanding these factors and challenges, the study provides insights how businesses can effectively adopt frugal innovation practices to develop cost-effective, sustainable, and community-driven solutions.

Keywords : *Frugal innovation, Sustainability, Conceptual model, Case-study, Entrepreneurship*

‘Innovation’, ‘Frugal Innovation’ and related concepts:

As stated in (OECD, 1999), “Innovation is a creative and interactive process involving market and non-market institutions. Innovation consists of the creative use of various forms of knowledge when responding to market-articulated demands and other social needs. Technical knowledge can be “codified” (in the form of publications, patents, blueprints, etc.) or “tacit” (embedded in the “know-how” and dexterity of individuals,

in organisational routines and the like). It can be “scientific” (stemming from either basic or applied research) or it can be “production and engineering” knowledge (e.g. derived from hands-on experience with production processes or from testing and experimenting).”

In underdeveloped and developing countries, companies initiated their operations with a focus on simplicity, striving to fulfill immediate consumer demands. This approach is exemplified by practices such as “jugaad” in India, “gambiarra” in Brazil, “Zizhu Chuangxin”

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in China, and "JuA kali" in Kenya. In English, a comparable strategy could be described as "do it and fix it", eventually it was named 'frugal' (Bencsik et al., 2016).

Frugal innovation (FI) describes a phenomenon whereby "solutions are developed to serve low-income customers, mainly in developing countries, with affordable products and services that help address pressing social and environmental problems" (Hossain et al., 2022).

Frugal entrepreneurship (FE) is increasingly acknowledged as a pivotal force in emerging markets, catering to the unmet demands of economically disadvantaged communities (Hossain & Sarkar, 2023). It has close connection with social and inclusive innovation. Innovations are often originated in developed countries and subsequently imitated by developing nations. Frugal innovations aim to bridge the poverty gap by offering cost-effective products and services tailored to the needs of individuals in developing nations and emerging markets (Numminen & Lund, 2017). The concept of FE is closely related to the well-established concept of social entrepreneurship.

Brem & Wolfram (2014) have defined 'Frugal Innovation' and other commonly used terms in their paper "Research and development from the bottom up - introduction of terminologies for new product development in emerging markets".

- ◆ **Jugaad:** "An improvisational approach to solving one's own or others' problems in a creative way, at a low cost, in a short amount of time, and without serious taxonomy or discipline, often due to poverty."
- ◆ **Frugal Innovation:** "A derived management approach, based on jugaad, which focuses on the development, production, and product management of resource-saving products and services for people at the Bottom of the Pyramid (BoP)."
- ◆ **Frugal Engineering/Constraint-based Innovation:** "a process-oriented approach to adapting existing technologies to local chal-

lenges by integrating local society to reduce development costs and time."

- ◆ **Gandhian Innovation:** "An approach that leverages the adaptation of existing technologies by integrating them into the local context or establishing local expertise to increase the social wealth of people from the BoP."
- ◆ **Catalytic Innovation:** "An approach that focuses on social change by breaking down existing social and economic structures and creating new market structures, leading to systematic, sustainable, and system-shifting development."
- ◆ **Grassroots Innovation:** "a bottom-up development approach that involves social integrity and local civilians as inventors, connecting people through social or technical networks to develop ecologically and socially acceptable products and services."
- ◆ **Indigenous Innovation:** "technology transfers, predominantly technology inflows, from developed to emerging countries and their effects on local entrepreneurs at the BoP."
- ◆ **Reverse Innovation:** "the development of new products in and for emerging countries by Domestic Market Firms (DMFs) or Emerging Market Firms (EMFs), which may also be introduced in developed markets if demand is identified. The extreme case of reverse innovation involves developing products in emerging countries solely for introduction in developed markets."

Knowledge and innovation go hand in hand, as sharing practices among employees drive innovation within organizations (Ravishankar et al., 2013). If knowledge doesn't spread well within an organization, and people don't share it; new solutions, ideas, and innovations could fade away (Bencsik et al., 2016). There is a question: 'Why do not the employees share their knowledge?' The reasons could be competition, lack of time and energy, or lack of understanding of what to share etc. That's why there is a need of Innovation culture.

According to (Berman & McLaughlin, 1976), "Innovations may result in disappointing

outcomes, not because of inadequacies of the innovative idea, but because of the difficult and uncertain process of implementing innovative efforts in an educational system that resists change.”

Characteristics of Frugal Innovation:

Frugal innovation concerns doing more with less resources. ‘Constraints are opportunities to develop innovative solutions’ (Agarwal et al., 2021). Resource constraints force to find new ways to utilize existing resources (Hossain & Sarkar, 2023). If we talk about Frugal Entrepreneurship, Hossain & Sarkar (2023) have shown three types of constraints in their study: 1. Resource constraints, 2. Institutional Constraints, and 3. Scale up Constraints. Here, the partnership with large firms can help to mitigate resource constraints. However, it may not always work due to misalignment of objectives.

Farooq (2017) argues in his research that “frugal innovation is a multidimensional construct with affordability, simplicity, quality, sustainability, resilience, management support and defeaturing as its dimensions.”

Below given are the characteristics of sustainable frugal innovation, as described by (Agarwal et al., 2014).

- ◆ **Cost-effective:** ‘Value for money, providing quality (not luxury) at prices that are affordable to Bottom of the Pyramid (BoP) customers.’
- ◆ **Resourceful:** ‘Do more with less, using minimal/least possible resources in the product development efforts.’
- ◆ **Easy-to-use:** ‘Human-centric, intuitive designs that require little to no prior knowledge or training to utilize.’
- ◆ **Sustainable:** ‘Environment-friendly, considering both societal and environmental effects.’
- ◆ **Problem-centric:** ‘Bottom-up approach, looking at the problem first and then develop-

ing a suitable solution, customer-centric rather than technology- or product-centric.’

- ◆ **No-frills:** ‘Simplification, seeking minimalistic features and functional requirements which get the job done.’
- ◆ **Fast-to-market:** ‘Timely to market, faster to deploy, and also considering all aspects of business from manufacturing to logistics.’
- ◆ **Breakthrough:** ‘Creating a novel creative solution which eventually disrupts the existing market and helps to shape an entirely new market.’

Frugal Innovation and Sustainability:

“Frugal innovations seek to create attractive value propositions for their targeted customer groups by focusing on core functionalities and thus minimizing the use of material and financial resources in the complete value chain. They substantially reduce the cost of usage and/or ownership while fulfilling or even exceeding prescribed quality standards” (Tiwari et al., 2016).

Frugal innovation is frequently linked to ecological and social sustainability due to its emphasis on resource minimization (such as raw materials, production resources, energy, fuel, water, waste, and financial resources), making it more cost-effective and accessible compared to conventional innovations (Albert, 2019).

The 17 Sustainable Development Goals (SDGs) underscore unresolved global issues like poverty alleviation and social inclusion. Inclusive strategies frequently spotlight frugal innovations tailored for the Base of the Pyramid and low-income markets, predominantly provided by the private sector. Within sustainability frameworks, the private sector serves as a significant force driving both exclusionary practices and the adoption of new inclusive solutions that improve quality of life, foster participation, and boost incomes (Arnold, 2018).

Examples of Frugal Innovations from the literature that lead to sustainability:

Name	Description	Link to Sustainability
MittiCool	A low-cost clay refrigerator designed for rural Indian areas that does not require electricity to cool items	Social, economic, and ecological
GE Portable Ultrasound Machine	A low-cost, portable ultrasound machine with limited functionalities	Social and economic
Nokia 1100	A low-cost mobile phone with core functionalities designed for low-income consumers in emerging markets	Social and economic
Qarnot Computing	Radiators that utilize surplus heat from high-performance computing processors to provide building heat	Economic and ecological
Isinnova CPAP Face Mask	A low-cost scuba mask repurposed into a CPAP mask with a 3D-printed ventilator valve, aiding in saving the lives of intensive-care COVID patients	Social and economic

Source: Endres et al. (2022)

Factors Influencing Sustainable Frugal Innovation

Sustainable leadership plays a vital role in the successful implementation of frugal innovation by fostering a clear sense of purpose and a long-term vision in organizations. Consistency and commitment are also important for the frugal innovation to thrive as innovation is not a one-time event but a continuous process of learning, adapting and creating practical solutions (Devina & Herachwati, 2024).

Beyond leadership, there are several other factors that influence how well frugal innovation develops and spreads viz. organizational culture, government policies, regulations, market conditions, and support from NGOs (Tiwari et al., 2016). Research shows that strong management support, government initiatives, and financial resources are also crucial for small and medium-sized manufacturers adopting sustainable innovation (Khurana et al., 2021).

An organization’s ability to implement frugal innovation also depends on its understanding of artificial intelligence (AI), the level of investment it can make, and how different success factors connect (Govindan, 2024). Unexpected events, like pandemics, often push businesses to adopt frugal innovation faster as they try to stay resilient. This

shows why sustainability—economic, environmental, and social—should be a key part of any innovation strategy.

Methodology Adopted:

This study employs a qualitative research approach, using case studies based on structured interviews to examine the factors and challenges businesses face while implementing frugal innovation ideas into products.

Research Objective:

To identify the factors and challenges involved in the successful implementation of frugal innovation ideas into the business products.

Research questions:

- ◆ What are the factors affecting the implementation of frugal innovation?
- ◆ What challenges do businesses face when adopting frugal innovation?

Case Selection:

Two successful cases of frugal innovation were selected for the in-depth analysis. These cases were chosen on the basis of implementation of frugal innovation and their strong alignment with the research objectives.

Data Collection - Structured Interviews: The interviews were designed to gather detailed information on the implementation process, key components, challenges encountered, and strategies employed to overcome these challenges.

Data Analysis - Thematic Analysis:

- ◆ The data collected from the structured interviews were subjected to thematic analysis to identify recurring themes and patterns related to the implementation of frugal innovation.
- ◆ Thematic coding was used to categorize the data into key themes, factors, challenges, and solutions.

CASE -1

“Innovating with Tradition: The Journey of Mitticool in Frugal Innovation”

In a world full of costly materials and technology, ‘Mitticool’ shines as a blend of tradition and sustainability. Founded by Mansukhbhai Prajapati and now run by his son, Raja Prajapati, Mitticool is a fine example of frugal innovation. With their roots in pottery, the Prajapati family has reinvented the traditional clay products to create eco-friendly solutions that can help to protect the environment.

Mitticool's journey is a story of resilience, creativity, and a strong commitment to sustainability. Their flagship product, a ‘clay refrigerator’ that works without electricity, showcases their innovative approach to offering affordable and sustainable solutions. This case study looks at Mitticool's strategy for product development, the challenges they've faced and overcome. Through their story, we see how a small, traditional pottery business has become a leader in frugal innovation, inspiring a new generation of sustainable entrepreneurs.

1. Family Background and Inspiration: In the interview, Raja Prajapati highlighted the strong influence of his family background, particularly the pottery tradition. His father, Mansukhbhai Prajapati, played a significant

role in reviving and innovating within the pottery business. Raja Prajapati mentioned, "This is our traditional business, pottery. We are coming from the potter background, Potter community. My father, Mr. Mansukh Prajapati, had to go with the pottery business only because for pottery business at that time there was no huge demand or awareness about the pottery business." His entrepreneurial journey was inspired by his father's efforts and the challenges he faced in the pottery business. He explained, "My father thought that traditional pot is really a refrigerator for poor people. He started his innovation journey, and it took him more than four years to develop that refrigerator. Finally, one sample was ready in 2004 and the product was named as ‘Mitticool’."

- 2. Product Innovation and Unique Features:** Mitticool's product range, including clay refrigerators, clay water filters, and various clay kitchenware, distinguishes from other products through their ecofriendly and sustainable features. He stated, "We check all the analytics reports. If the clay is lead-free or any of the chemicals, then only we use that clay to develop the pottery. We have more than 800 SKU products in the same kitchenware, pottery business."
- 3. Stages of Development and Implementation:** The process from idea generation to product implementation involves resource assessment, production planning, and market strategy. Raja Prajapati stated, "First, we look for the resources, the availability of manpower who can develop the product, the time-frame, production cycle, and the marketing strategy to market the product."
- 4. Identifying Market Needs and Challenges:** Raja emphasized the importance of addressing market needs and challenges. He mentioned, "We have to take care of all the challenges and go through different challenges. Each and every segment will be having challenges."

- 5. Customer Insights and Market Demands:** Gathering insights from customers is crucial for Mitticool's product development. Raja explained, "When we exhibit our products in different regions, whatever the customer base is, retail or wholesale, they express their view about the product. We are getting the idea of making new products from the audience."
- 6. Frugal Innovation Approach:** Mitticool focuses on frugal innovation to create affordable and ecofriendly products. Raja shared, "My father is coming from a poor background, and when he was a child, he suffered many difficulties. He thought about developing the clay refrigerator which would run without electricity or pollution."
- 7. Overcoming Hurdles:** The startup faced significant hurdles in gaining market acceptance. Raja noted, "The first reaction from the market is that it is made of clay, and people are not easily accepting this type of product. But after giving the guidance of the product, they are ready to buy."
- 8. Resource Utilization for Frugal Solutions:** Mitticool leverages available resources creatively to develop frugal solutions. Raja mentioned, "We started with one idea to make the refrigerator. When we went to the market, people liked our idea and our development. They always need something unique from our side."
- 9. Problem-Solving Approaches:** The startup employs innovative problem-solving approaches to address market needs. Raja explained, "We developed this type of clay refrigerator which was without electricity. It directly impacted the village region because people were looking for a container to keep vegetables and fruits for more than four to five days."
- 10. Fostering Creativity within the Team:** Raja emphasized the role of team collaboration in fostering creativity. He stated, "Whenever we think about developing any of the products, it starts with my father's idea. Then our team goes through the ideology of which type of product creation and for what purpose."
- 11. Leadership and Team Management:** Effective leadership and team management are crucial for Mitticool's operations. Raja described, "We have more than 300 people's team, and we have a particular job role for different groups of people. We first identify which type of work we can give to that group of people."
- 12. Principles and Strategies for Frugal Innovation:** Mitticool's innovation approach is guided by principles of eco-friendliness, sustainability, and health benefits. Raja explained, "Our aim is to develop a fully set-up of clay. We think first for the environment, we think for the health of the living thing, and there should not be any type of side effect while using the product."
- 13. Market Demand and Seasonal Trends:** Understanding market demand and seasonal trends is essential for Mitticool's product strategy. Raja explained, "We take examples from previous years of sales or any of the marketing setups and do the same setup." He also mentioned, "Our product range has a seasonal business setup and is territory-oriented. We check the availability of the source and go with the availability of the source."
- 14. Competitor Analysis and Differentiation:** Mitticool differentiates itself by focusing on quality and innovation rather than competing with local manufacturers. Raja stated, "We don't think about competitors. We want to develop the same streamline and innovative products. We don't have any proper competitors in the market."
- 15. Engaging with Partners and Customers:** Mitticool engages with partners, suppliers, and customers to refine its solutions. Raja

shared, "We call them digital partners. We introduce our products, guide them, and approach our pricing structure and marketing strategy."

16. Collaborations and Partnerships: Mitticool has received significant support from NGOs and government entities rather than formal partnerships with other ventures. He acknowledged, "We were supported and we are supported with different types of NGOs, government entities, like the National Innovation Foundation, Shrishti Sanstha, Gyan Sanstha. These NGOs helped us a lot. I also thank the Gujarat government and Indian government for their support in our innovations."

17. Addressing Environmental Concerns and Promoting Sustainability: Mitticool's products are designed to be environmentally friendly and promote sustainability. He emphasized, "Our refrigerator doesn't require any type of energy, which means no electricity. The process of generating electricity is harmful to the environment, and our product helps avoid that. Additionally, our products are made of clay, which is a natural material, and they are recyclable." He also stated, "Our products are 100% ecofriendly and made of clay. There is no environmental footprint."

18. Impact on Communities: Mitticool has had a positive impact on the communities it serves. He noted, "There is a very good impact on social life, especially for traditional pottery makers. They now have proper business policies and quality products. People see our products as good for health and ecofriendly."

19. Navigating Regulatory and Compliance Requirements: Raja Prajapati explained, "There is no law compliance required for this traditional method of business. The government provides good policies to develop this type of product, and consumers respond positively."

20. Measuring the Impact and success of Frugal Innovation: He discussed how Mitticool

measures the impact of its innovations. He said, "People are getting aware of clay products and their benefits. We receive positive responses from the market, and the young generation is also looking for sustainable products."

21. Continuous Learning and Improvement: Raja Prajapati highlighted the importance of continuous learning. He stated, "We keep learning from customer reviews and government policies. We try to come up with proper solutions and upgrade our product development and marketing strategies."

22. Lessons Learned: Raja Prajapati mentioned, "We have learned that not all market solutions are accepted positively. Sometimes, we need to redesign or rethink our products. There are many lessons, and we always face difficulties with new ideas." He also shared, "We have learned a lot from past innovations. We now have a good community of customers and proper infrastructure. Before launching a new innovation, we discuss it with our community and analyze market scenarios."

23. Future Vision for the Startup: "We are trying to upgrade our setup and introduce new ventures. We are working on the Mitticool house, which will maintain a comfortable temperature without electricity", Raja Prajapati stated about his vision.

24. Effective Strategies for Frugal Innovation: He advised, "When going for frugal innovation, develop a strategic plan to address a particular community's problem. Proper analysis is crucial for a product's success." He also stated, "Financial considerations should be secondary for frugal innovation. Focus on developing a solution that addresses a community's problem and stands out from existing market setups."

25. Advice for Other Startups: Raja advised other startups, "Always understand the market and address the community's problems. Focus on natural, chemical-free resources and involve your team in the innovation process."

CASE 2:

“From Sparrows to Sustainability: The Eco Roots Foundation's Journey in Frugal Innovation”

Rakesh Khatri, also known as the ‘Nest Man of India’, made a shift from photography and filmmaking to environmental conservation. He founded the Eco Roots Foundation in 2012 following his passion for sparrows (which was because of his childhood in Chandni chowk, Old Delhi, where sparrows were a common sight). His foundation works to protect the ecosystem particularly addressing the decline in the population of sparrows due to spike in Urban growth. This case study explores the foundation’s mission, creative solutions, community engagement and sustainable practices, to understand how significant environmental change can be achieved with limited resources.

1. Personal and Professional Background: "The sight of sparrows in my childhood and their gradual disappearance deeply influenced my mission." Rakesh Khatri's journey started off with photography and filmmaking background. A childhood in Old Delhi's Chandni Chowk stirred a deep connection to sparrows that inspired his transition to environmental conservation.
2. Entrepreneurial Inspiration: A sharp decline in the sparrows as brought out in the 'State of India's Birds' report motivated Rakesh Khatri to take action. This is when he said he began conservation efforts as a voice for these silent beings, watching sparrows disappeared due to urbanization and environmental changes.
3. Previous Entrepreneurial Ventures: His foray into entrepreneurship was in the media industry as a photographer and a short filmmaker, wherein he often told stories related to environmental issues through visual narratives.
4. Vision/Mission: Eco Roots Foundation is dedicated to environmental and ecosystem conservation. Its mission is to tackle environmental degradation through innovative solutions and education. The foundation's vision is a sustainable and ecologically balanced future where communities actively participate in preserving the ecosystem. He mentioned, "Our mission is to create a sustainable future through community involvement and education."
5. Products and Services: Eco Roots Foundation offers various initiatives, including Nest Making Workshops, Plogging, Nature Trails, Water Body Restoration, Customizable Nursery, Eco Theatre, The Nest Wall, Green Curriculum, E-Waste Management, and Sustainable Solutions Consultancy also. These efforts focus upon conservation using eco-friendly materials and creative methods along with education.
6. Idea Generation and Implementation: The idea for Eco Roots Foundation originated from observing the sharp decline in the population of sparrows and understanding its ecological impact. As he stated, "urbanization and modern architectural designs have left no room for sparrows, prompting us to create safe nesting spaces", the foundation identified the need for safe nesting spaces and broader environmental education as primary requirement.
7. Identifying Needs and Gathering Insights: Initially, Eco Roots Foundation conducted field research, community surveys, and pilot projects to understand habitat requirements and community willingness. Feedback from workshops and direct engagement also provided them valuable insights to refine their solutions and approaches.
8. Motivation for Frugal Innovation: "We had to be creative with limited resources to develop effective conservation solutions." Facing constraints in the availability of eco-friendly

- materials and initial community resistance, motivated the foundation to be creative. They developed durable and attractive nests with limited resources.
9. **Resource Constraints and Creative Solutions:** Eco Roots Foundation creatively leveraged available resources by using locally available materials like bamboo, jute, and recycled Tetra packs to create cost-effective nests. Community involvement and volunteer networks helped in resource mobilization as Rakesh Khatri mentioned, "using locally available materials and engaging the community were key to our success."
 10. **Management and Problem-Solving:** The foundation approached problem-solving with a hands-on, community-driven approach. They started conducting workshops where participants made their own nests. This approach helped to solve the problem of awareness. It also ensured wider adoption. Techniques like brainstorming sessions, field visits, and continuous experimentation with materials and methods fostered creativity within the team.
 11. **Leadership Style:** "I believe in leading by example and valuing every team member's input." Rakesh Khatri stated. He leads by example. He actively participates in all initiatives and fosters an open and collaborative environment where every team member's input is valued.
 12. **Frugal Innovation Principles:** "Empowering local communities and using available resources creatively are central to our approach." Eco Roots Foundation's frugal innovation approach involves sustainability, community involvement, and resource efficiency. They focus on using locally available and recycled materials to empower local communities, especially women and children.
 13. **Challenges and Overcoming Them:** Initially, the foundation faced skepticism and resource constraints. However, Persistence, experimentation, and community feedback helped to refine the methods. Engaging local communities and building a network of volunteers were crucial in overcoming these challenges.
 14. **Internal and External Factors:** Internal factors such as a dedicated team and a strong mission-driven approach facilitated efforts of Eco Roots Foundation. Externally, collaborations with local communities, schools, and government departments provided the support needed for large-scale implementation.
 15. **Market Demand and Differentiation:** Eco Roots Foundation assesses demand through community feedback, participation rates in workshops, and the success of pilot projects. They differentiate themselves through their community-centric approach. Their focus on frugal innovation, setting them apart from other environmental conservation organizations.
 16. **Collaboration and Partnerships:** The foundation actively engages with local communities, schools, and corporate partners through workshops and collaborative projects. Feedback from these stakeholders helps to refine solutions. Collaborations with the Department of Forest and local schools have been pivotal in expanding their impact.
 17. **Environmental Considerations:** Eco Roots Foundation addresses environmental concerns by promoting sustainability and using eco-friendly materials. Their projects, such as the Eco Nest Library and Jal Sparsh project, focus on environmental education and conservation. Promoting sustainability and using eco-friendly materials are at the core of their initiatives.

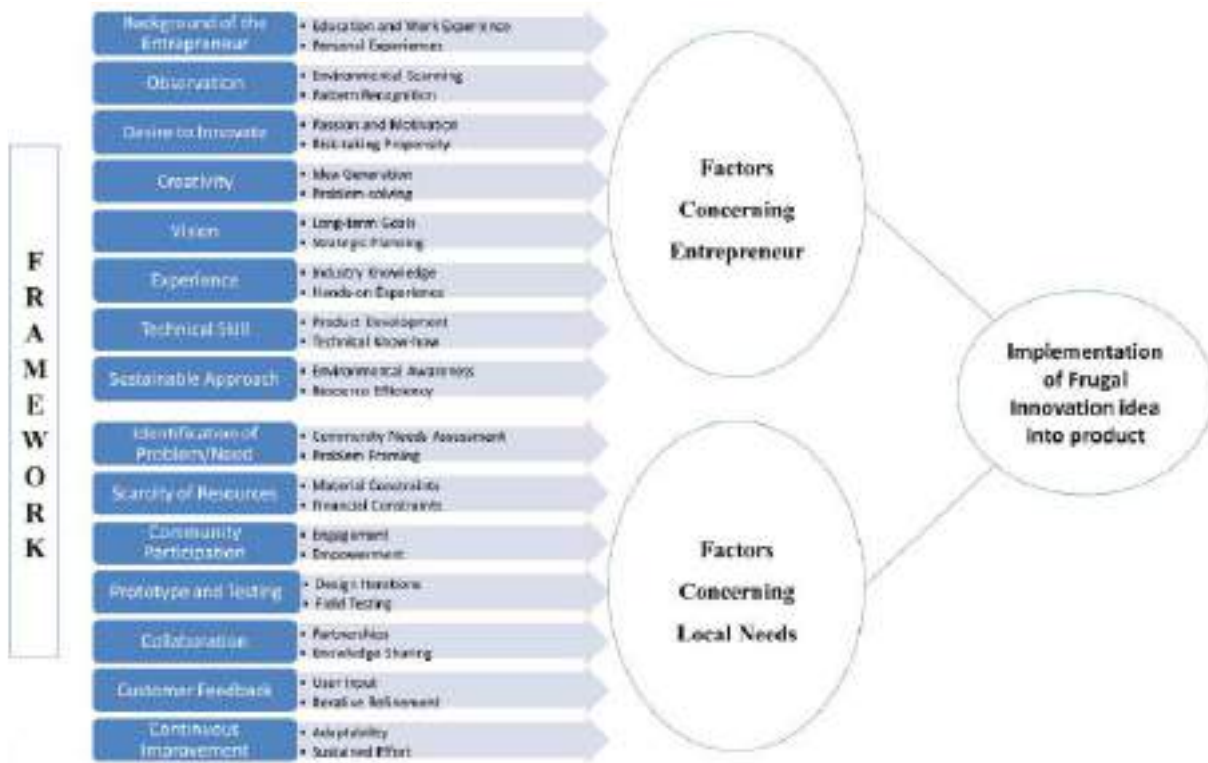
18. **Regulatory and Compliance:** "Adhering to regulations and collaborating with authorities ensure our compliance and credibility." The foundation navigates regulatory and compliance requirements by adhering to local regulations and working closely with authorities to ensure compliance.
19. **Impact Assessment:** Eco Roots Foundation measures impact through the number of nests created and adopted, participation rates in workshops, and community feedback. Key performance indicators include the number of nests adopted, workshop attendance, and the extent of community engagement. "We measure our impact through nests created, workshop participation, and community feedback."
20. **Continuous Improvement:** The foundation conducts regular feedback sessions with communities and participants to gather insights and improve methods. Continuous experimentation and adaptation are integral to their approach, allowing for refining projects based on real-world feedback. "Regular feedback and continuous experimentation help us refine our projects."
21. **Future Outlook:** In the next 3-5 years, Eco Roots Foundation aims to expand initiatives across more regions in India, launching new projects focused on water conservation, biodiversity preservation, and environmental education. They plan to develop more community-driven projects combining economic empowerment with environmental conservation.
22. **Lessons Learned:** Valuable lessons include the importance of community involvement and feedback in designing effective solutions. Persistence and adaptability are crucial in overcoming initial setbacks and refining approaches. Effective strategies include using locally available materials and engaging communities from the outset.
23. **Entrepreneurial Qualities for Frugal Innovation:** For frugal innovation, creativity, resilience, adaptability, and strong commitment to sustainability, are key qualities. It is also important to be open to experimentation and learn from each failure. "We all need creativity, resilience and a strong commitment to sustainability to foster our frugal innovation."
24. **Advice for Startups:** Rakesh Khatri advises startups to first understand the local environment and involve the community from the start. He emphasizes that trial and error are part of the process, but the key is to make the most of available resources to create something meaningful. His message is simple—stay persistent and committed to your mission, even when challenges arise.
25. **Additional Insights:** The Eco Roots Foundation shows that the combination of sustainable practices and community involvement can bring changes for both, our current environment and our future generations. The mission seeks volunteers who would help to build an equitable world together.

Conceptual Framework: Factors Affecting Implementation of Frugal Innovation idea into product:

Frugal innovation is important for creating impactful solutions which are frills-free and cost-effective. There are mainly two types of interrelated factors which affect the successful transformation of a frugal innovation idea into a tangible product: 1) Factors concerning entrepreneur and 2) Factors concerning the local needs.

This conceptual framework has been developed from the insights of case studies. This framework provides nuanced understanding of the factors

which are important and required for the successful implementation of any frugal innovation idea into actual tangible business product.



A.	FACTORS CONCERNING ENTREPRENEUR	KEY ELEMENTS	DESCRIPTION
1	Background of the Entrepreneur	Education and Work Experience: Influencing perspective and approach.	The prior careers and education background that shape how an entrepreneur views challenges and opportunities.
		Personal Experiences: Shaping the entrepreneur's vision and drive.	Life experiences that motivate the entrepreneur to innovate or pursue specific goals.
2	Observation	Environmental Scanning: Ability to notice and analyze environmental and community needs.	The ability to identify trends, changes, and emerging needs in the surrounding environment.
		Pattern Recognition: Identifying recurring problems or opportunities.	Recognizing recurring themes or issues in a particular field that could lead to innovative solutions.
3	Desire to Innovate	Passion and Motivation: Drive to create solutions and make a difference.	The internal desire to bring about change or solve problems, motivated by personal values and beliefs.
		Risk-taking Propensity: Willingness to take calculated risks for innovative gains.	A readiness to take risks, understanding both the potential benefits and drawbacks.

4	Creativity	Idea Generation: Ability to think outside the box for novel solutions.	The capacity to come up with new, unique ideas to address problems or create opportunities.
		Problem-solving: Developing practical solutions to complex problems.	The ability to devise workable and efficient solutions to challenges that arise during innovation.
5	Vision	Long-term Goals: Clear objectives for future growth and impact.	Establishing specific goals that define the future trajectory of the business or innovation.
		Strategic Planning: Mapping out steps to achieve the vision.	Creating a clear plan that outlines the necessary actions to meet long-term goals.
6	Experience	Industry Knowledge: Understanding the specific industry and its challenges.	Deep understanding of the industry in which the entrepreneur operates, including its issues and trends.
		Hands-on Experience: Practical knowledge gained through direct involvement.	Gained expertise through direct experience, which provides a stronger foundation for decision-making.
7	Technical Skill	Product Development: Skills in designing and creating prototypes.	The ability to develop a tangible product from concept to prototype, including design and testing.
		Technical Know-how: Expertise required to develop functional products.	Specialized knowledge necessary to ensure products are developed to meet desired functionality and quality.
8	Sustainable Approach	Environmental Awareness: Commitment to creating eco-friendly solutions.	A focus on minimizing negative environmental impact through the creation of sustainable products.
		Resource Efficiency: Using minimal resources effectively.	The ability to create value using as few resources as possible, ensuring costeffectiveness and sustainability.
B.	FACTORS CONCERNING LOCAL NEEDS	KEY ELEMENTS	DESCRIPTION
9	Identification of Problem/Need	Community Needs Assessment: Researching and understanding the community's specific needs.	Conducting research to identify the actual needs and gaps within a particular community.
		Problem Framing: Clearly defining the problem to be addressed.	The process of precisely articulating the problem to guide the development of a solution.
10	Scarcity of Resources	Material Constraints: Limited availability of materials and resources.	Challenges due to the lack of sufficient materials, impacting the scope and scale of innovation.
		Financial Constraints: Budget limitations impacting project scope.	Insufficient funds or limited financial resources that constrain the scale or scope of a project.

11	Community Participation	Engagement: Involving community members in the innovation process.	Actively engaging the local community to ensure the solution meets their needs and preferences.
		Empowerment: Ensuring the community feels ownership of the solution.	Ensuring that the community feels responsible for and involved in the creation and use of the solution.
12	Prototype and Testing	Design Iterations: Creating and refining prototypes based on feedback.	Developing initial designs, gathering feedback, and continuously refining the prototype to improve it.
		Field Testing: Testing solutions in real-world settings to ensure functionality.	Implementing prototypes in actual environments to evaluate their functionality and gather real-world data.
13	Collaboration	Partnerships: Working with local organizations, schools, and authorities.	Establishing partnerships with local entities to facilitate innovation and adoption.
		Knowledge Sharing: Leveraging expertise from various stakeholders.	Collaborating with external experts and stakeholders to share knowledge and improve the innovation process.
14	Customer Feedback	User Input: Collecting feedback from end-users to improve the product.	Gathering opinions and insights from the intended users to better align the product with their needs.
		Iterative Refinement: Continuously improving the product based on feedback.	Constantly evolving the product based on the feedback received from users, ensuring continuous improvement.
15	Continuous Improvement	Adaptability: Adjusting approaches based on feedback and learning.	Flexibility to modify strategies and methods as new information or challenges emerge.
		Sustained Effort: Long-term commitment to refining and improving solutions.	Dedication to ongoing improvements to ensure the solution continues to meet evolving community needs.

For the successful implementation of frugal innovation ideas into business products, characteristics of the entrepreneurs and their capacity to respond to local needs are very important.

sustainable and creative solutions. Their risk-taking attitude, technical skills and creativity, allow the development of cost-effective, frills-free, sustainable solutions, even with limited resources.

Entrepreneurs with diverse backgrounds, work experience, and personal life stories often bring a unique perspective on the table. That helps in identifying creative solutions tailored to the local needs/challenges. Their ability to observe the problems, recognize recurring patterns, a clear long-term vision and sustainable approach is important to find out

On the other hand, addressing local needs is also a vital thing for the successful implementation of frugal innovation ideas into tangible products. A deep understanding of community problems, coupled with active participation from local stakeholders, enables the creation of products that are not only functional but also widely accepted.

Effective collaboration with local organizations, schools, and authorities facilitates knowledge sharing and strengthens the innovation process. Apart from that, continuous customer feedback and iterative testing ensure that the product meets the needs of the community. It is also important that the community feels a sense of ownership, for a long-term success and sustainability of frugal innovation solutions.

Main Challenges:

Bringing Sustainable frugal innovation to life is not always an easy thing. Limited available resources, lack of awareness, skepticism, questions

about product’s durability etc. can create hurdles. Educating people about the benefits of the frugal innovation is also a challenge that requires patience and feedback from the community.

The customers and other stakeholders can be skeptical about the effectiveness of the idea. If the early attempts don’t work as expected, they could be met with mockery or criticism. Consumers also often hesitate to trust the durability of the product because of the type of raw-material used. To tackle all these challenges, a strategic approach is required that involves community engagement, continuous improvement and strong advocacy for sustainable frugal innovation.

CHALLENGES	DESCRIPTION	EXAMPLE/QUOTE
1. Resource Constraints	Limited availability of eco-friendly materials and financial resources.	"We faced constraints in availability of eco-friendly materials, and initial community resistance."
2. Lack of Awareness	Difficulty in educating the community about the benefits and importance of the innovation.	"Persistence and community feedback were essential in refining our methods and overcoming challenges."
3. Skepticism	Initial resistance from the community and stakeholders about the feasibility and effectiveness of the innovation.	"Our early attempts at creating nests were met with mockery, and some materials failed to work."
4. Durability of the Product	Ensuring that the product is durable and sustainable in the long term.	"First reaction from the market was, as it is made from clay, what is the durability? Because people are not engaged with the same type of products."

This conceptual model shows how different factors are connected in driving the successful implementation of frugal innovation ideas into products. It focuses on overcoming challenges and maximizing the positive impact on both the community and the environment. It can guide the entrepreneurs how they can come up with a creative solution and transform that idea into a sustainable business product which is also widely accepted.

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Exhibit:

Case -1



Case -2



FINANCIAL FRAUDS IN THE ERA OF DIGITIZATION: CHALLENGES AND SOLUTIONS

Aman Goel & Dr. Rajeev Johari*

Abstract

The rapid digitization of the finance and investment sector has brought about numerous benefits, such as increased accessibility, efficiency, and convenience. However, it has also given rise to a concerning surge in frauds and scams. The purpose of this study is to delve into the complexities of this issue and propose effective solutions to mitigate the risks associated with financial crimes in the context of the digitization era.

One of the primary challenges is the evolving nature of cyber threats, as fraudsters adapt to the latest technologies to exploit vulnerabilities in the financial system. Traditional methods of fraud prevention are often inadequate in this fast-paced digital landscape. The study aims to identify innovative technological solutions and security measures that can be implemented to safeguard financial transactions and investments from malicious activities.

Furthermore, the research sheds light on the impact of inadequate financial literacy among the Indian population. The lack of understanding about financial products, investment strategies, and the risks involved makes individuals more susceptible to falling victim to scams and fraudulent schemes. The study explores the correlation between low financial literacy levels and the prevalence of financial frauds, emphasizing the need for comprehensive educational initiatives to empower people with the knowledge and skills necessary to navigate the digital financial landscape safely.

We also have suggested a model called "AKAI". The AKAI model empowers individuals in navigating investments, minimizing fraud and losses. Implemented through education, it fosters a culture of informed and responsible investing, reducing the likelihood of financial risks.

Keywords : *Digitization, Finance, Investments, Frauds, Risks, Challenges*

Introduction

India's remarkable economic growth is mirrored by the rapid expansion of its financial sector, a phenomenon fueled in large part by advancements in technology and digitization. The country's Gross Domestic Product (GDP) has experienced significant growth, driven by factors such as urbanization, a burgeoning middle class, and government initiatives aimed at economic development.^[1]

The financial sector, a crucial component of India's economic landscape, has evolved alongside the broader economic expansion. Technology has played a pivotal role in transforming the financial

services industry, making it more accessible, efficient, and inclusive. The digitization of financial services has been a key catalyst for this transformation, bringing about a paradigm shift in how individuals access and engage with financial products.^[2] One of the prominent indicators of this transformation is the escalating number of retail investors in India. Traditionally, investing was considered a complex and cumbersome process, often limited to a small segment of the population. However, with the advent of technology, particularly the widespread availability of smartphones and internet connectivity, investing has become more democratized.^[3] Digital platforms and mobile applications have emerged

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as powerful tools, allowing individuals to seamlessly participate in the financial markets. The ease of opening online trading accounts, accessing market information in real-time, and executing trades from the comfort of one's home has contributed to the surge in retail investors. This increased participation has not only broadened the investor base but has also democratized wealth creation, enabling a larger section of the population to benefit from India's economic growth.

The use of technology in the financial sector has also facilitated the development of innovative financial products and services. Fintech companies, in particular, have played a significant role in introducing novel solutions, from digital payment systems to robot-advisors and peer-to-peer lending platforms. These innovations have not only enhanced the overall efficiency of the financial system but have also catered to the diverse needs of the growing base of retail investors.^[4] Furthermore, the government's push towards financial inclusion and the promotion of a cashless economy has further accelerated the adoption of digital financial services. Initiatives like the Pradhan Mantri Jan Dhan Yojna (PMJDY) have aimed at bringing unbanked and underbanked populations into the formal financial system, leveraging technology to provide them with access to banking services.^[5]

Objective

The objective of the study is to shed light on the legal aspects and challenges associated with irregularities and frauds occurring in the Indian finance market and stock market as a consequence of the digitization trends within the sector.

◆ **Background on Digitization in the Finance Market:**

Begin by providing a brief overview of the digitization trends in the Indian finance market. Highlight how advancements in technology have transformed traditional financial practices, making transactions and investments more digital and accessible.

◆ **Significance of the Study:**

Explain why it is crucial to examine the legalities and issues arising from irregularities and frauds in the context of digitization. Discuss the potential impact on investors, market stability, and overall confidence in the financial system.

◆ **Identifying Irregularities and Frauds:**

Break down the various forms of irregularities and frauds that have surfaced in the wake of digitization. This might include cybercrimes, identity theft, market manipulation, and other fraudulent activities facilitated by technological advancements.

◆ **Legal Framework in India:**

Examine the existing legal framework and regulations in India that are meant to address financial irregularities and frauds. Discuss any recent changes or updates to the legal landscape that specifically address challenges posed by digitization.

◆ **Challenges and Loopholes:**

Highlight the challenges faced by regulatory bodies in adapting to the fast-paced changes brought about by digitization. Discuss any existing loopholes in the legal framework that may be exploited by fraudsters in the digital landscape.

◆ **Mitigation Strategies:**

Propose potential strategies and recommendations to address the identified legal issues and mitigate the risks associated with irregularities and frauds in the digitized finance and stock markets. This may include suggestions for enhancing regulatory measures, improving cybersecurity, and promoting investor education.

By elaborating on these points, the study aims to provide a comprehensive understanding of the legal challenges posed by irregularities and frauds in the Indian finance and stock markets as a result of the ongoing digitization.

Current Situation

In delving into the challenges and intricacies of the investment sector, this section of the research aims to comprehensively address various issues that stakeholders encounter. These issues encompass concerns, risks, uncertainties, and frauds, all of which play significant roles in shaping the landscape of the investment environment.

Firstly, concerns within the investment sector can stem from a variety of sources. Market volatility, geopolitical events, economic downturns, and changes in regulatory frameworks are examples of factors that can give rise to apprehensions among investors. Addressing these concerns requires a thorough understanding of the dynamic nature of financial markets and the ability to adapt to changing circumstances.^[6]

Risks are inherent in any investment, and this research segment aims to identify and analyze these risks comprehensively. Market risk, credit risk, liquidity risk, and operational risk are some of the key factors that investors need to consider. Additionally, external factors such as global economic conditions and geopolitical tensions contribute to the overall risk profile of investments. By examining these risks, the research provides insights into risk management strategies that can help investors navigate the uncertainties associated with their investment portfolios.

Uncertainties in the investment sector often arise from unpredictable events or market dynamics. Economic recessions, natural disasters, and unforeseen geopolitical developments can create an atmosphere of uncertainty. The research seeks to explore how investors can build resilience in the face of uncertainties, employing strategies such as diversification, thorough risk assessments, and a dynamic approach to portfolio management.

Frauds represent a critical challenge in the investment sector, posing threats to both individual investors and the overall integrity of financial

markets. This section of the research scrutinizes various forms of fraud, including Ponzi schemes, insider trading, and misinformation campaigns. Understanding the motives and methods behind fraudulent activities is crucial for developing effective countermeasures and enhancing investor protection.

Possible reasons for the aforementioned issues are multifaceted and require a nuanced analysis. Rapid technological advancements, while bringing numerous benefits, can also expose the investment sector to new forms of cyber threats and fraudulent activities. Global interconnectedness and interdependence among financial markets contribute to the transmission of risks across borders. Additionally, gaps in regulatory frameworks or enforcement may create opportunities for fraudulent activities to persist.

Basically, this part of the research serves as a comprehensive examination of concerns, risks, uncertainties, and frauds within the investment sector. By dissecting these issues and identifying possible reasons behind them, the research provides a foundation for developing proactive strategies, risk mitigation measures, and regulatory enhancements to foster a more resilient and secure investment environment.

Indian Stock Market

The Indian stock market, also known as the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE), plays a crucial role in India's financial system and is a significant contributor to the country's economic growth. Here are some key aspects of the Indian stock market:

- ◆ **Market Structure:**
- **BSE and NSE:** The Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE) are the two primary stock exchanges in India. Both exchanges facilitate the trading of equities, commodities, and derivatives.

- Indices: The BSE Sensex and the NSE Nifty are the benchmark indices that represent the performance of the Indian stock market. They consist of a diversified set of stocks from various sectors.
- ◆ Regulatory Framework:
 - SEBI: The Securities and Exchange Board of India (SEBI) is the regulatory authority overseeing the securities market in India. SEBI regulates and supervises stock exchanges, brokers, and other market participants to ensure fair and transparent dealings.
- ◆ Market Participants:
 - Investors: Individuals, institutional investors, foreign institutional investors (FIIs), and mutual funds are among the various participants in the Indian stock market.
 - Companies: Companies raise capital by issuing shares to the public through initial public offerings (IPOs) and subsequently trade on the stock exchanges.
- ◆ Trading Mechanism:
 - Equity and Derivatives: The Indian stock market offers both equity and derivatives trading. Equity trading involves buying and selling shares of companies, while derivatives trading includes futures and options contracts based on underlying securities.
- ◆ Market Indices:
 - Sensex and Nifty: The BSE Sensex comprises 30 large and well-established companies, while the NSE Nifty consists of 50 stocks representing various sectors. These indices are widely used to gauge the overall health of the stock market.
- ◆ Market Regulations and Reforms:
 - Dematerialization: India adopted a dematerialized form of trading in the late 1990s, replacing physical share certificates with electronic form to enhance efficiency and reduce the risk of fraud.
- ◆ Market Challenges:
 - Goods and Services Tax (GST): The implementation of GST has had an impact on various sectors, influencing stock prices and market dynamics.
 - Volatility: The Indian stock market can experience significant volatility due to global economic factors, domestic economic conditions, and geopolitical events.
 - Risk Management: Ensuring effective risk management is essential for investors and market participants to navigate the uncertainties of the market.
- ◆ Technological Advancements:
 - Algorithmic Trading: The use of algorithmic trading has increased, bringing efficiency and liquidity to the market.
 - Online Trading: The advent of online trading platforms has made it easier for retail investors to participate in the stock market.

The Indian stock market continues to evolve, influenced by both domestic and international factors. Regulatory reforms, technological advancements, and market participant behavior collectively shape the dynamics of the market, making it a crucial component of India's financial landscape.

Digitization in Investments and Stock Market

The digitization of investments and the Indian stock market has ushered in a transformative era, revolutionizing various aspects of financial processes, accelerating growth rates, and facilitating new entries into the market. This digitization has been driven by advancements in technology, regulatory changes, and the growing demand for more accessible and efficient financial services. Let's explore how digitization has reshaped the landscape:^[7]

- ◆ Efficiency and Speed:
 - Trading Platforms: Digital platforms and online trading systems have streamlined the process of buying and selling stocks. Investors can execute trades with a few clicks, eliminating the need for physical paperwork and reducing transaction times significantly.
 - Real-time Information: Digital platforms provide investors with real-time information on stock prices, market trends, and financial news. This accessibility enhances decision-making processes and allows investors to respond promptly to market changes.
- ◆ Dematerialization:
 - Paperless Trading: The digitization of securities has led to dematerialization, eliminating the need for physical share certificates. Investors now hold and trade securities in electronic form, reducing the risk of loss or fraud associated with physical certificates.
- ◆ Financial Inclusion:
 - Access for Retail Investors: Digital platforms have democratized access to the stock market, allowing retail investors to participate more actively. Online brokerage accounts and mobile trading applications have made it easier for individuals to invest, contributing to a significant increase in the number of retail investors.
- ◆ Robot-Advisors and Algorithmic Trading:
 - Automated Investment Platforms: The rise of robot-advisors has provided investors with automated, algorithm-based financial advice and portfolio management. These platforms use data analytics and machine learning to tailor investment strategies based on individual risk profiles and goals.
 - Algorithmic Trading: Institutional investors and traders leverage algorithmic trading to execute large and complex transactions efficiently. Algorithms analyze market data and execute trades at high speeds, optimizing trading strategies.
- ◆ Block chain and Cryptocurrencies:
 - Decentralized Finance (DeFi): Block chain technology, the underlying technology of cryptocurrencies, has opened up possibilities for decentralized finance. Smart contracts and block chain-based platforms offer alternatives to traditional financial intermediaries, allowing for more efficient and transparent financial transactions.^[8]
- ◆ Regulatory Changes:
 - Digital KYC and Aadhaar: Digital Know Your Customer (KYC) processes, coupled with the use of Aadhaar (unique identification), have simplified customer onboarding for financial services. This has enhanced the speed and efficiency of account opening, reducing paperwork and manual verification processes.
- ◆ Educational Resources and Investor Awareness:
 - Online Resources: Digitization has enabled the dissemination of educational resources, market analysis, and investment insights through online platforms. Investors have access to a wealth of information, empowering them to make more informed decisions.
 - Financial Literacy Apps: Mobile apps and online courses contribute to improving financial literacy, helping investors understand investment concepts, risk management, and market dynamics.

In short, the digitization of investments and the Indian stock market has been a revolutionary force, bringing efficiency, accessibility, and innovation to the financial sector. This transformation has not only optimized existing processes but has also paved the way for new entrants, fostering a more inclusive and dynamic financial ecosystem in India.

Major Points for Concern

◆ Security Issues:

While the digitization of investments has brought numerous benefits, it has also introduced certain security challenges for retail investors in India. It's crucial for investors to be aware of these issues and take necessary precautions to safeguard their financial assets. Here are some key security concerns for retail investors using digital platforms for investments in India:[9]

◆ Cybersecurity Threats:

- **Phishing Attacks:** Cybercriminals often use phishing techniques to trick investors into disclosing sensitive information, such as login credentials. Retail investors should be cautious about clicking on suspicious links or providing personal information through unsolicited emails or messages.
- **Malware and Viruses:** Malicious software can infect devices and compromise the security of digital platforms. Investors should use reputable antivirus software and keep their devices updated to minimize the risk of malware attacks.

◆ Account Security:

- **Weak Passwords:** Using weak or easily guessable passwords can make investor accounts vulnerable to unauthorized access. It is advisable to create strong passwords that include a combination of letters, numbers, and special characters.
- **Two-Factor Authentication (2FA):** Enabling two-factor authentication adds an additional layer of security by requiring a second form of verification, such as a code sent to a mobile device, in addition to the password.

◆ Unsecured Wi-Fi Networks:

- **Public Wi-Fi Risks:** Accessing investment platforms on unsecured public Wi-Fi networks can expose investors to potential secu-

rity breaches. Investors should avoid conducting sensitive transactions on public networks and opt for secure, private connections.

◆ Fraudulent Investment Schemes:

- **Ponzi Schemes and Scams:** Digital platforms may be targeted by fraudsters promoting fake investment schemes. Retail investors should be cautious about unsolicited investment opportunities and thoroughly research before making any investment decisions.

◆ Data Privacy Concerns:

- **Data Breaches:** In the event of a data breach, personal and financial information may be compromised. Investors should choose platforms with robust security measures, including encryption, to protect sensitive data.

◆ Regulatory Compliance:

- **Compliance with Regulations:** Investors should choose platforms that comply with regulatory standards and guidelines set by authorities such as the Securities and Exchange Board of India (SEBI). Compliant platforms are more likely to have security measures in place to protect investors.

◆ Lack of Investor Education:

- **Phishing Awareness:** A lack of awareness about phishing and other cyber threats may make investors more susceptible to fraudulent activities. Investor education programs can play a crucial role in enhancing awareness and promoting safe online practices.

◆ Third-Party App Risks:

- **Unverified Apps:** Using unverified or unauthorized third-party applications for trading or investment purposes can expose investors to security risks. Investors should only use official and reputable apps provided by authorized financial institutions.

To mitigate these security concerns, retail investors in India should prioritize cybersecurity awareness, adopt secure practices, and choose reputable and regulated digital platforms. Staying informed about potential threats and regularly updating security settings can go a long way in ensuring a safe and secure investment experience in the digital era.

◆ Options Trading

- 9 out of 10 individual traders in equity Futures and Options Segment, incurred net losses.
- On an average, loss makers registered net trading loss close to ₹50,000.
- Over and above the net trading losses incurred, loss makers expended an additional 28% of net trading losses as transaction costs.
- Those making net trading profits, incurred between 15% to 50% of such profits as transaction cost.

[Source: SEBI study dated January 25, 2023 on “Analysis of Profit and Loss of Individual Traders dealing in equity Futures and Options (F&O) Segment”, wherein Aggregate Level findings are based on annual Profit/Loss incurred by individual traders in equity F&O during FY 2021-22. Read SEBI Report >]^[10]

◆ Operators Involvement

Stock market operators are the people who artificially boost volumes in stocks by trading in circles and increasing the price of the securities. They are often referred to as the manipulators of the share market. When the traders start purchasing the share to book quick profits, the manipulators sell their shares which results in a fall in the share price.

With the prices falling, the traders then want to sell their stocks, but there are no buyers present, and the manipulators book great profits in this. The main target of the manipulators is the small-cap and mid-cap stocks.^[11]

How do Stock Market Operators Influence Investor Decision-Making?^[12]

Stock market operators exert influence on investor decisions through two primary channels: the order book and intraday trading.

Order Book:

The order book holds considerable sway over retail investors, detailing buy and sell orders for a specific stock. It displays the quantity of stocks available in the market for purchase and sale at varying prices. Notably, retail investors can access information only on the next 5 orders, unlike stock market operators who possess visibility beyond this limit. This discrepancy in access can potentially expose deceptive practices, such as the placement of fraudulent orders by operators.

Intraday Trading:

Intraday trading, synonymous with day trading, involves the buying and selling of shares within market hours, necessitating traders to close positions by the end of the trading day. A volatile stock market serves as an opportune setting for this type of trade. Stock market operators strategically influence prices by engaging in bulk trading, subsequently closing their positions by day's end.

Consider a scenario where operators initiate mid-day stock sales, causing a drop in stock prices. This induces panic among retail investors, prompting them to sell stocks to mitigate potential losses. Through this tactic, stock market operators can realize substantial profits within a single day.

The intricacies of the techniques employed by stock market operators can be convoluted and challenging for ordinary retail investors to decipher. Investors can safeguard themselves from substantial losses by implementing protective measures such as stop-loss orders.

Understanding the Pump and Dump Scam:

The pump and dump scam involves the illicit promotion of a held stock by an investor, relying on false and misleading statements. This fraudulent scheme has become increasingly prevalent with the widespread use of the internet.

Perpetrators disseminate online messages urging swift stock purchases, often claiming to possess insider information. Consequently, the stock's price experiences an artificial surge. Once unsuspecting investors buy shares, the fraudsters swiftly sell their holdings, precipitating a subsequent decline in the stock's value. Ultimately, new investors incur financial losses.

These scams typically target small and mid-cap stocks due to their susceptibility to manipulation. Scheme promoters generate hype and unfounded rumors, artificially inflating the stock's price for their gain.

Methodology and Analysis Results

◆ **Research Sample**

The study adopts a research methodology centered on primary data collection, utilizing a quiz administered through Google Forms. The sample for this study comprises 50 participants and is geographically confined to the Delhi National Capital Region (NCR). This strategic selection of the sample location provides a focused examination of perspectives and insights within a specific regional context.

The participants enlisted in the study exhibit diversity across various dimensions, ensuring a well-rounded representation of views. The sample encompasses individuals with distinct education-

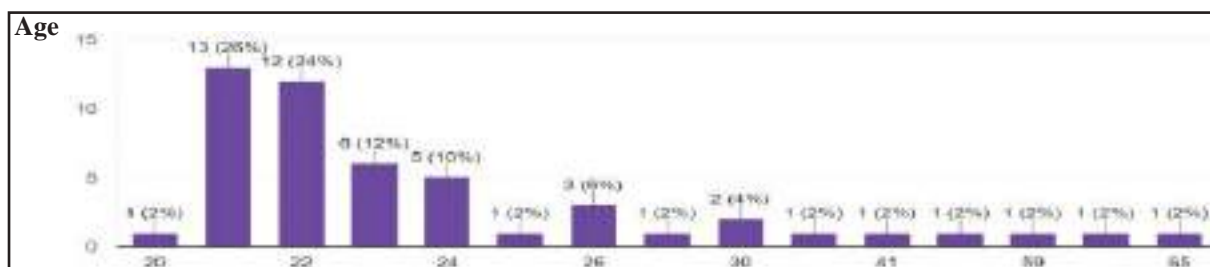
al backgrounds, spanning various levels of academic attainment. This approach ensures that the study captures a spectrum of perspectives influenced by different levels of educational exposure and expertise.

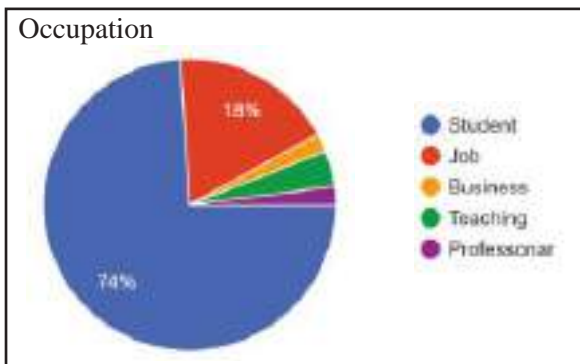
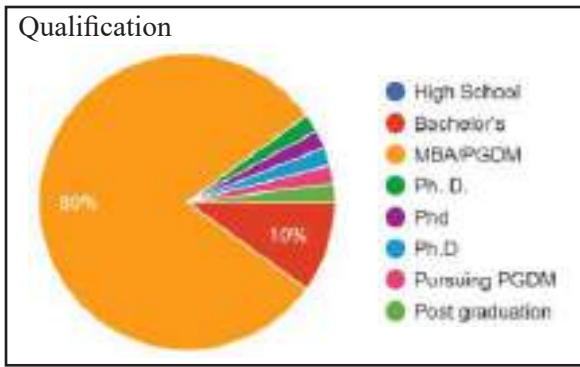
Occupational diversity is another critical facet of the sample composition. Participants from various occupational backgrounds contribute unique insights influenced by their professional experiences. This diversity enriches the study by incorporating a range of viewpoints shaped by distinct work environments, industries, and career trajectories.

The inclusion of participants from different age groups further enhances the breadth of the study. Varied age demographics offer a comprehensive understanding of how perspectives on the research topic may evolve or differ across generations. This multi-generational approach allows for nuanced insights into the subject matter.

Conducting the quiz through Google Forms not only provides a user-friendly and accessible platform for participants but also facilitates efficient data collection and analysis. The digital nature of the quiz allows for seamless participation and swift compilation of responses, contributing to the overall efficiency of the research process.

By employing this methodology and ensuring diversity in sample representation, the study aims to generate findings that are both comprehensive and reflective of the rich tapestry of perspectives within the Delhi NCR region. The insights garnered from this diverse sample are anticipated to offer valuable contributions to the understanding of the research topic and potentially uncover patterns or trends that may have implications beyond the immediate geographical context.





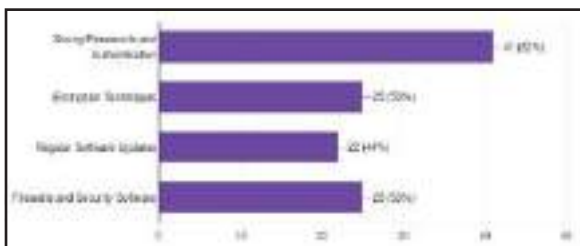
◆ **Data Basis**



By adopting this approach to question design, the study aims to utilize participant responses as valuable indicators of financial literacy levels. The insights derived from the collected data are expected to contribute meaningfully to the understanding of the participants' knowledge about investment, potentially revealing areas that may require additional education or awareness initiatives.

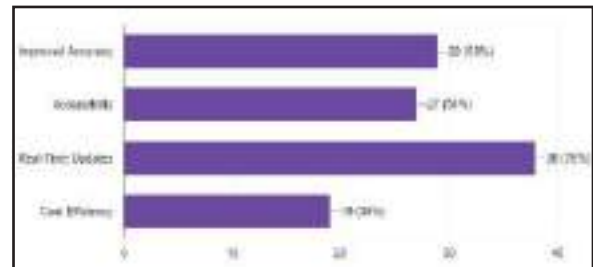
◆ **Questions and Responses**

1. What security measures would you consider while engaging in online trading platforms to protect your digital assets?



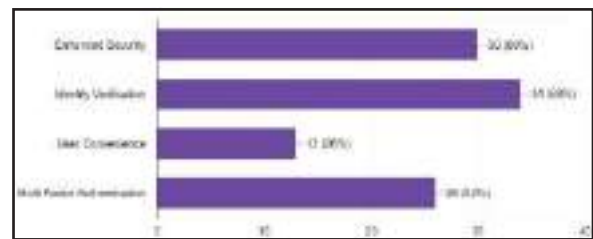
The majority prioritize security through strong passwords and authentication (82%), encryption techniques (50%), and firewalls/security software (50%). Regular software updates (44%) receive slightly less emphasis. Investors recognize the importance of multifaceted security measures in protecting digital assets during online trading.

2. What are the key advantages of digitized investment tracking and reporting over traditional way of doing it?



Investors overwhelmingly appreciate digitized tracking for improved accuracy (58%), accessibility (54%), and real-time updates (76%). Cost efficiency (19%) is acknowledged but to a lesser extent, indicating a strong preference for the convenience and timeliness of digital platforms.

3. Explain the role of biometric authentication in securing investment portfolios.



Respondents recognize biometric authentication for enhanced security (60%) and identity verification (68%). While a significant portion acknowledges user convenience (26%), multi-factor authentication (52%) is considered important. Biometric methods are perceived as robust measures in securing investment portfolios.

4. How can investors manage the risk of volatility associated with digital currencies in their portfolios?



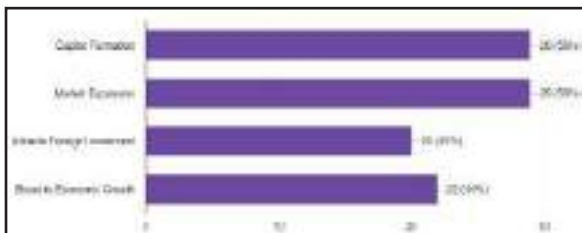
Investors manage digital currency volatility through risk hedging (46%), long-term perspective (48%), and seeking expert advice (60%). This indicates a diversified approach to handling the inherent volatility associated with digital currencies in investment portfolios.

5. Discuss the implications of algorithmic trading on market liquidity in the current times.



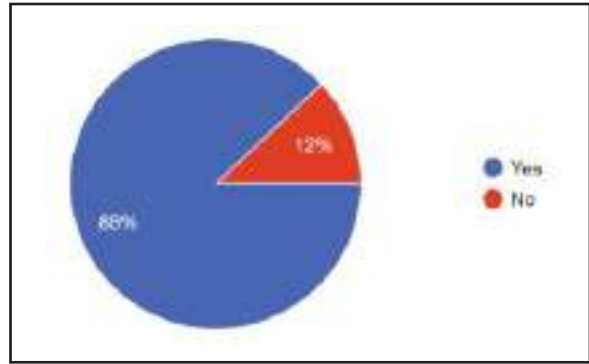
Algorithmic trading is seen to enhance efficiency and price discovery (54%) but is also associated with increased market fragmentation (58%), flash crashes, and volatility (32%). Respondents acknowledge the impact of algorithmic trading on traditional market makers.

6. What is the role of IPO in the growth of financial sector?



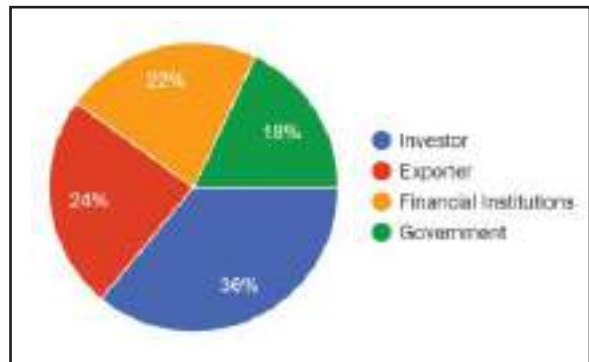
IPOs contribute to capital formation (58%), market expansion (58%), attracting foreign investment (40%), and boosting economic growth (44%). The majority recognizes the multifaceted role IPOs play in the growth of the financial sector.

7. Do you support NSDL's two factor authentication?



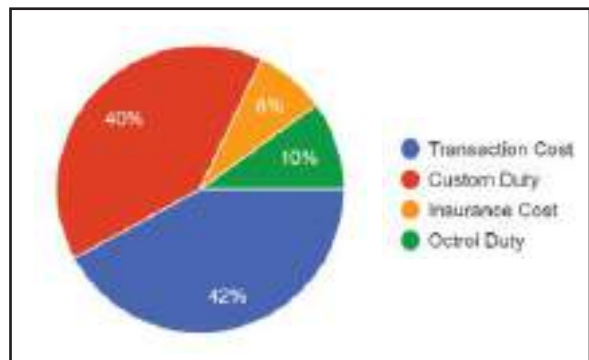
A significant majority supports NSDL's two-factor authentication (88%), indicating a strong endorsement of enhanced security measures in financial transactions.

8. When international conflict arises, which segment of individual's opinion disturbed?



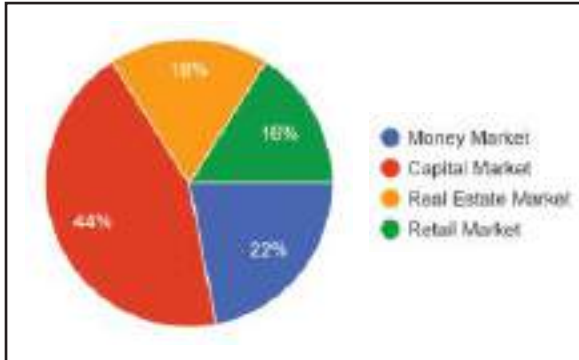
During international conflicts, individual opinions of investors (36%), exporters (24%), and financial institutions (22%) are disturbed. This highlights the broader impact of geopolitical tensions on various segments.

9. What cost cutting do you recommend so that India can establish dominance in the world.



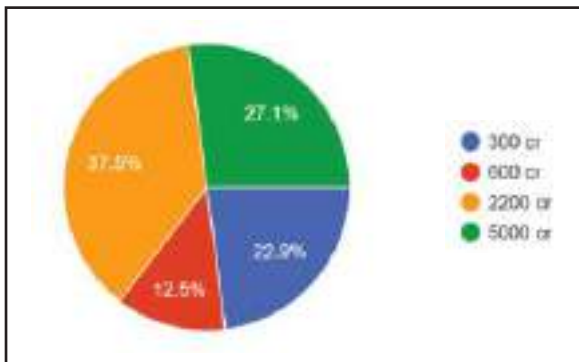
Respondents recommend cost-cutting in transaction costs (42%), custom duty (40%), and to a lesser extent in insurance costs (8%) and octroi duty (10%) for India to establish dominance globally.

10. Which type of market served as a valuable partner in finance and commerce industry?



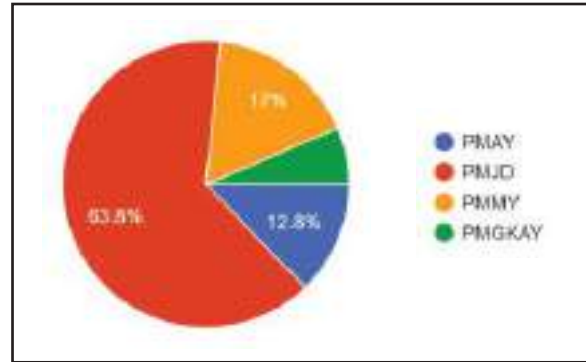
The capital market is recognized as a valuable partner in the finance and commerce industry by 44%, followed by the money market (22%). Real estate and retail markets receive lesser emphasis.

11. In National Stock Exchange(NSE), how much transactions are exchanged in India?



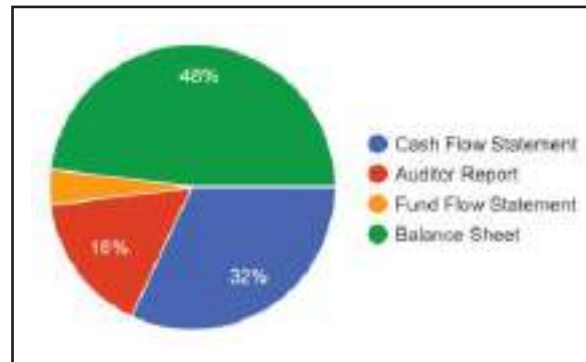
Responses vary on the transactions exchanged in NSE, with percentages distributed across different transaction volume options. The distribution indicates varied perceptions of NSE's transaction scale.

12. Which Yojna has benefitted the banking and finance industry at most?



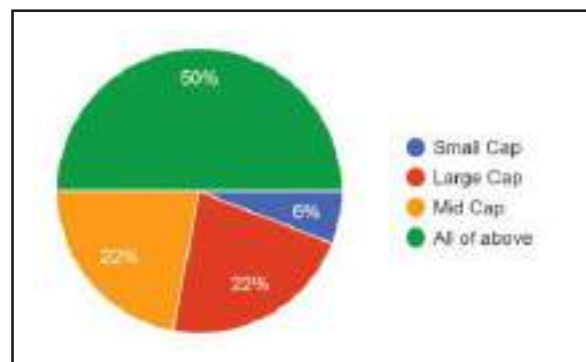
PMJDY is perceived as the most beneficial Yojna for the banking and finance industry (63.8%), followed by PMAY (12.8%), PMMY (17%), and PMGKAY (6.4%).

13. While investing in a company, which financial tool should be taken in consideration?



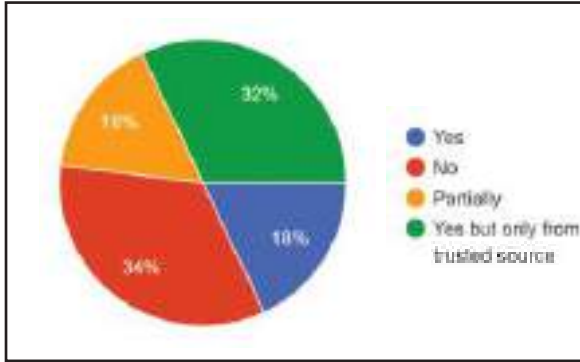
The majority considers the balance sheet (48%) as the crucial financial tool while investing. Cash flow statement (32%) is also recognized, while auditor report (16%) and fund flow statement (4%) receive less emphasis.

14. According to current scenario, in which sector retail investor should invest?



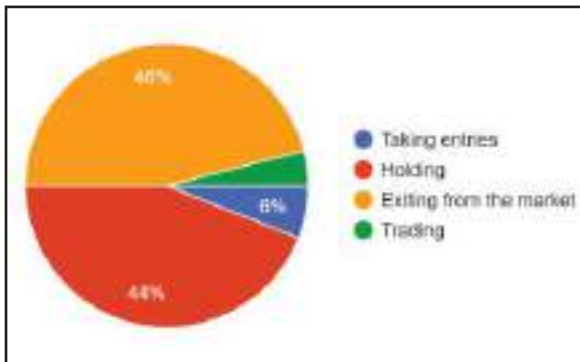
Respondents suggest investing in all sectors (50%), with mid-cap (22%) and large-cap (22%) also being favored. Small-cap investments receive the least emphasis (6%).

15. Should an individual borrow money for investing?



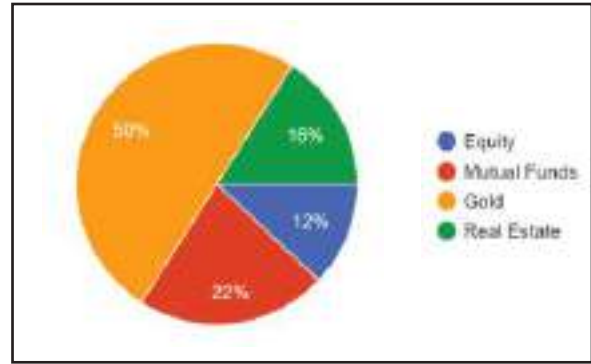
Opinions on borrowing for investing vary, with 34% against it, 32% in favor but only from trusted sources, 18% in favor, and 16% partial to the idea. This indicates a diverse stance on leveraging for investment.

16. What was the mood of retail investors in COVID Era?



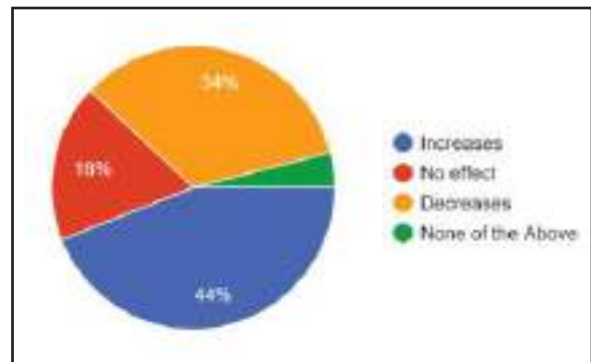
Responses indicate a significant portion of retail investors holding (44%) during the COVID era, while others were either entering (6%), exiting (46%), or actively trading (4%).

17. Which is the safest option for investing?



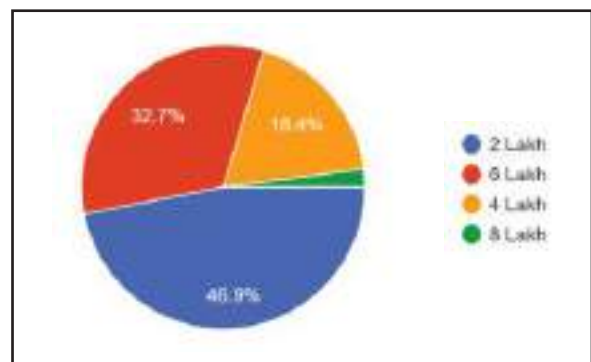
Gold is perceived as the safest option for investing (50%), followed by mutual funds (22%), equity (12%), and real estate (16%). The distribution highlights a preference for tangible assets.

18. At the time, when a company distributes dividend on equity shares, the price of share generally



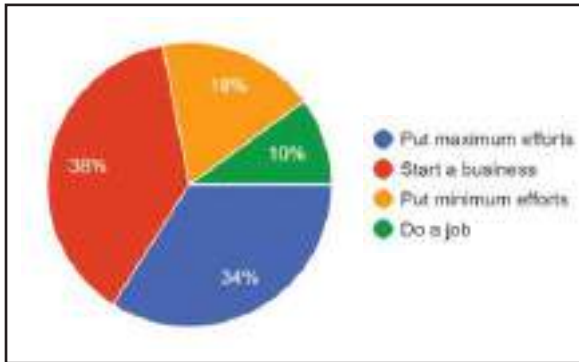
Respondents believe that the share price generally increases (44%) when a company distributes dividends on equity shares. A portion perceives no effect (18%), and a significant number believes it decreases (34%).

19. The limit of IPO application per transaction on UPI is



The majority recognizes a 2 Lakh limit (46.9%) on IPO application per transaction on UPI, with lesser percentages for 6 Lakh (32.7%), 4 Lakh (18.4%), and 8 Lakh (2%).

20. To earn passive income, an individual has to



Respondents suggest starting a business (38%) and putting minimum efforts (18%) as ways to earn passive income. Putting maximum efforts (34%) and doing a job (10%) receive comparatively less endorsement.

◆ Data Analysis

It implies that a study conducted in India reveals a concerning trend: people in the country lack sufficient financial literacy and knowledge about digitization. This deficiency in understanding financial concepts and adapting to digital advancements is suggested to be a significant factor contributing to individuals falling victim to financial and investment frauds, resulting in financial losses. Let's elaborate on this observation:

Financial Literacy Gap:

The study suggests that there is a noticeable gap in financial literacy among the surveyed individuals in India. Financial literacy involves understanding basic financial concepts, investment strategies, and the ability to make informed financial decisions. The apparent lack of financial knowledge can leave individuals vulnerable to making uninformed choices in managing their finances and investments.

Limited Understanding of Digitization:

The study indicates that there is a lack of understanding among the surveyed population regarding digitization. In the context of finance and investments, digitization refers to the adoption of digital technologies and platforms for managing financial transactions and investments. The insufficient knowledge about digitization may make individuals more susceptible to fraudulent activities that exploit digital channels.

Increased Vulnerability to Frauds:

The combination of low financial literacy and limited knowledge about digitization makes individuals more susceptible to various financial and investment frauds. Scammers often exploit gaps in understanding to deceive individuals through fraudulent schemes, online scams, or misleading investment opportunities.

Financial and Investment Losses:

As a consequence of the aforementioned factors, individuals are more likely to suffer financial losses. The lack of awareness about sound financial practices and the risks associated with digitized transactions may lead people to make poor investment decisions or fall victim to fraudulent activities, resulting in monetary setbacks.

Need for Education and Awareness:

The findings from the study underscore the importance of enhancing financial literacy and promoting awareness about digitization among the population. Education initiatives can play a crucial role in empowering individuals to make informed financial decisions, recognize potential risks, and adopt secure practices in the digital financial landscape.

Policy Implications:

The study's observations may have implications for policymakers, emphasizing the need for

targeted interventions to improve financial education at both individual and community levels. Policymakers may consider implementing programs and initiatives that enhance financial literacy and raise awareness about the secure use of digital financial services.

In summary, the elaboration on the statement suggests that the identified deficiencies in financial literacy and knowledge about digitization in India contribute to a heightened risk of individuals falling prey to financial and investment frauds, ultimately resulting in financial losses. Addressing these gaps through education and awareness initiatives becomes imperative to mitigate these risks and promote a more secure financial environment.

“The statement highlights a critical issue – the potential vulnerability of individuals in India to financial and investment frauds due to a perceived lack of financial literacy and knowledge about digitization. Addressing this gap through targeted educational initiatives, increased awareness campaigns, and robust regulatory measures is essential to protect individuals from falling victim to fraudulent activities and experiencing avoidable financial losses.”

◆ **Conclusion**

In conclusion, the study underscores a pressing concern regarding the vulnerability of individuals in India to financial and investment frauds, driven by a noticeable gap in financial literacy and limited understanding of digitization. The identified deficiencies contribute to a heightened risk of individuals making uninformed financial decisions and falling victim to fraudulent activities, ultimately leading to financial losses.

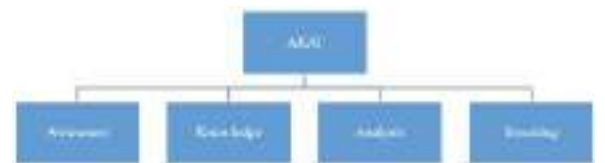
Addressing this issue requires a multifaceted approach. Educational initiatives aimed at enhancing financial literacy are crucial to empower individuals with the knowledge needed to make informed decisions about their finances and investments. Simultaneously, awareness campaigns

about the risks associated with digitization and secure financial practices are essential to mitigate vulnerabilities to online frauds.

Furthermore, policymakers should consider implementing robust regulatory measures to safeguard individuals from fraudulent schemes and ensure the integrity of financial transactions in the digital landscape. Collaborative efforts between government bodies, financial institutions, and educational institutions are imperative to create a comprehensive framework for promoting financial awareness and literacy.

In essence, the study highlights the urgent need for proactive measures to bridge the financial literacy gap, increase awareness about digitization, and strengthen regulatory safeguards. By doing so, India can foster a more resilient and secure financial environment, ultimately protecting individuals from avoidable financial losses and empowering them to make sound financial decisions in an increasingly digitized world.

Now Introducing the "AKAI" model represents a comprehensive approach aimed at empowering individuals with the necessary tools and understanding to navigate the complex world of investments while minimizing the risks of frauds and losses. Let's delve into the components of the AKAI model:



Awareness (A):

Digitization Awareness: The first step involves creating awareness about digitization, emphasizing the shift towards digital platforms in financial transactions and investments. Individuals need to be informed about the benefits and risks associated with the digitized financial landscape.

Security Threats: Building awareness about potential security threats at the financial market is

crucial. This includes educating individuals about common scams, phishing attempts, and other fraudulent activities prevalent in the digital space. Understanding these threats is fundamental to safeguarding one's financial assets.

Self-Protection: Individuals should be equipped with knowledge on how to protect themselves. This includes guidance on setting up strong passwords, implementing two-factor authentication, recognizing phishing attempts, and using secure networks. Empowering individuals to take proactive measures enhances their ability to secure their digital assets.

Knowledge (K):

Sector-Specific Knowledge: Before diving into investments, individuals should gain in-depth knowledge about the sector they are considering. This involves understanding industry trends, market dynamics, and the factors that influence the performance of specific sectors. Education on financial instruments and their implications is also essential.

Risk Assessment: Knowledge about risk is critical. Individuals need to assess the risk associated with different investment options, understand the concept of diversification, and be aware of their risk tolerance. This knowledge forms the foundation for making informed investment decisions aligned with their financial goals.

Analysis (A):

Data Analysis: Encouraging individuals to analyze historical data and trends in the market provides insights into potential future movements.

This involves understanding market indicators, economic factors, and other variables that impact investments. Data-driven decision-making enhances the likelihood of making informed investment choices.

Market Trends: Analysis of market trends allows individuals to anticipate shifts in the market and adjust their investment strategies accordingly. This proactive approach helps in navigating the dynamic nature of financial markets.

Investment (I):

Healthy Investing Practices: Armed with awareness, knowledge, and analysis, individuals are now ready for the investment phase. This involves making well-informed and strategic investment decisions aligned with their financial objectives. Implementing diversification strategies, understanding the investment horizon, and staying updated with market developments are key elements.

Continuous Learning: The "Investment" phase also emphasizes the importance of continuous learning. Markets evolve, and staying informed about new trends, regulations, and economic shifts ensures that individuals can adapt their investment strategies over time.

Implementing the AKAI model through educational programs and resources can significantly reduce the likelihood of frauds and losses, promoting a culture of informed and responsible investing. By fostering awareness, building knowledge, encouraging analysis, and guiding healthy investment practices, individuals can navigate the financial landscape with greater confidence and resilience.

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RESEARCH

A STUDY ON EXPLORING SUSTAINABLE TOURISM INNOVATIONS AND ASSESSING CUSTOMER SATISFACTION WITH ONLINE TRAVEL AGENTS

Valentina Vincent Kini & Dr. Varsha Ganatra*

Abstract

This paper investigates sustainable tourism innovations and customer satisfaction within online travel agents (OTAs). Sustainable tourism, vital for environmental preservation and economic growth, is increasingly relevant in the travel industry. OTAs play a significant role in shaping consumer choices, making their sustainability efforts crucial. The study aims to identify key sustainable tourism innovations by OTAs and evaluate their impact on customer satisfaction and loyalty. Through a secondary research analysis, this paper integrates existing literature and empirical studies to understand the effectiveness of sustainable practices in enhancing customer experiences within the online travel booking sector. It also examines factors influencing customer satisfaction. This research contributes to both theoretical understanding and practical implications for stakeholders, aiding informed decision-making and strategic planning for sustainable development in tourism.

Keywords : Sustainable tourism, Online travel agents, Customer satisfaction, Innovation.

Introduction

In the post-pandemic era, sustainable tourism has immense potential as one of the primary goals of this type of tourism is to prevent overcrowding of tourist destinations and help to revive the tourism industry. Sustainable tourism aims to enhance the economic and socio-cultural aspects of tourism to increase awareness of consumers while protecting the environment (Streimikiene et al. 2021). Sustainable tourism needs to understand the needs of the tourists and make sure the tourism experience brings high satisfaction among its users. Among other things, sustainable tourism is fixated on promoting lesser-known tourism destinations and making the experience of the tour organic (Palacios-Florencio et al. 2021). In India, sustainable tourism is heavily valued by the government, the Ministry of Tourism introduced the “National Strategy for Sustainable Tourism” when ensure that wildlife-sensitive places and tourism spots are secured, the strategy also makes the sector more resilient and inclusive

to safeguards the natural and cultural resources of the nation. Tour operators and organisations performing sustainable tourism needs require “Sustainable Tourism for India Criteria and Indicators (STCI)” certificates to ensure proper sustainable practices are being followed (Invest India, 2023).

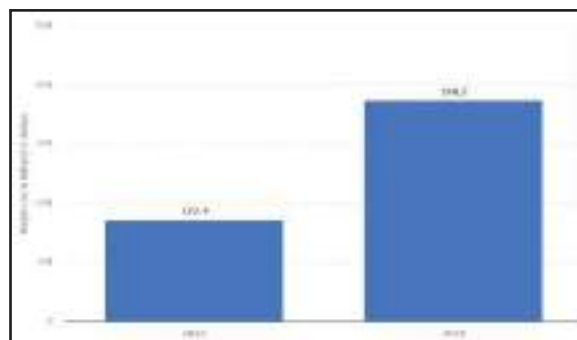


Figure 1: Sustainable Tourism Market Worldwide
(Source: Statista, 2023)

The image above showcases that the sustainable tourism industry was estimated to be 172.4 billion U.S. in 2022 and is further projected to reach 374.2

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billion U.S. by the year 2028 (Statista, 2023). Online travel agencies (OTAs) are essentially organisations that help consumers book their hotels, flights and other travel services online. Research shows that OTAs are a very competitive market and therefore these services need to constantly provide their consumers with the best experience to keep them invested and purchasing through their platforms (Abdul Murad, Sivapathy & Mohd Nor, 2021). With the help of the innovations introduced by OTAs, consumers can effortlessly browse and purchase tourism products and services for their needs. OTAs can significantly help with meeting consumer demands while providing

them with eco-friendly accommodations, OTAs can simultaneously encourage hotels and resorts to prioritise energy efficiency and energy resources to further protect their renewable resources. The purpose of the present research is therefore to learn about the different sustainable tourism innovations that the OTA platforms have introduced and how they have influenced and increased consumer satisfaction. The revenue from the top OTA organizations showcase how the revenue of the platforms has continued to increase over the years, Booking Holidays leading the list with 21.4 billion U.S in 2023 (Statista, 2024).

Characteristic	2019	2020	2021	2022	2023
Booking Holdings	15,066	6,796	10,958	17,090	21,365
Expedia Group	12,067	5,199	8,598	11,667	12,839
Airbnb	4,805	3,378	5,992	8,399	9,917
Trip.com Group	5,129	2,809	3,143	2,909	6,269
Tripadvisor	1,560	604	902	1,492	1,788
MakeMyTrip [†]	527	189	295	533	728
Despegar	525	131	323	538	706
eDreams Odigeo [†]	633	241	334	577	689
Trivago	942	304	412	574	535
Lastminute.com Group	392	128	163	316	350
On the Beach Group	194	97	42	174	218

Figure 2: Revenue of OTA Platforms

(Source: Statista, 2024)

Objectives of the study:

- ◆ To understand the potentialities of AI technology bring in assisting consumers in booking their tours sustainably.
- ◆ To explore the potentialities of OTA websites and apps in raising consumer satisfaction through environmental awareness.
- ◆ To understand how OTA partnerships with local communities help with enhancing consumer experience while valuing and

preserving cultural heritage.

Literature Review

Sustainable tourism is all about efficiently managing the existing resources to make sure the social, and economic needs are maintained. While the definition of sustainable tourism differs across several domains, the primary goal is to increase cultural awareness, integrity and biodiversity of the regions (Elmo et al. 2020). The rapid growth

of the tourism sector has been reported to create significant issues towards sustainable tourism, as competitiveness is one of the greatest issues in this context, increasing the level of innovation in this field can help with business operations. Studies also point out that increasing the level of interconnection can help in shaping the tourism business and help with implementing innovation (Streimikiene et al. 2021). Technological development in the tourism sector has significantly slowed down due to the pandemic, increasing it has the potential to develop solutions to deal with the existing problems. The use of technology can encourage organisations to make use of renewable resources which have a direct impact on climate change mitigations. Sustainable tourism also needs to support the local community, creating jobs and maintaining social integrity for the disabled people in the communities can make consumers appreciate the initiatives.

Technological innovations such as big data and AI robots can enhance service delivery, the real time data that they provide can also be utilized for crowd controlling and safeguarding the interests of the people. Technological developments allow organisations to holistically develop strategies instead of focusing on direct and narrow goals. The use of the Internet of Human Things (IoHT) makes the tourism ecosystem smarter, and the sustainable initiatives that these technologies provide help generate trust among consumers (Li et al. 2022). Artificial intelligence (AI) increases the level of analytical skills of organisations and creates new avenues through which the tourism sector can be rejuvenated. The purpose of sustainable tourism is not only to preserve nature and make businesses more socially responsible, rather it oversees all three economic, social and environmental protection dimensions. Sustainable innovations in the field of tourism need to meet social and environmental targets through consumption practices that are environment-friendly (Van et al. 2020). The use of innovation in this field would also help in the development of new services that attract more tourists who are responsible.

The issues with sustainable tourism can be addressed by providing new tourism services such as overseeing the sustainable development of local communities and creating new features for disabled and old people. The needs of consumers are constantly changing, the tourism sector needs to carry out demographic profiling to develop products and services that address these environmental and social issues (Nirwana, 2019). The emergence of the OTA in the tourism sector is relatively new, and one of the primary reasons for its success is the continuous innovation that it develops to make its websites and mobile applications more consumer friendly. The speed and convenience which the OTA platforms provide help in attracting consumers globally. Tourism generates a substantial amount of foreign exchange which contributes towards sustainable economic growth and OTAs can help generate income, diversify the economy and increase awareness towards the local and tribal cultures around the world (Ren, 2024).

Consumers of the modern era are concerned about the sustainability aspect of the products and services that they use, therefore OTA platforms which seek to generate profit can provide sustainable facilities and environment-friendly accommodations to their consumers (Ren, 2024). The increased pressure from governing bodies has made hotels adopt more sustainable practices, which further helps consumers with planning their trips. The OTA platform can maximise their profit while still considering the strategic response of hotels, this way they can attract more environmentally conscious tourists and raise their satisfaction levels while still generating profit (Garcia, Dos Anjos & Doğan, 2022). Studies also suggest that OTAs need to build strong relationships with surrounding communities to both innovate and develop capabilities that can make the tourism value chain more successful.

Literature Gap

The previous studies have been observed in the literature review section suggest that

sustainable tourism has the potential of raising consumer satisfaction but the studies have evaluated the topic in a general context. Technological innovation has been credited to be one of the most influential methods through which tourism practices can be made more successful but the studies have not explored these innovations in detail. There have been mentions of AI, IoT and big data but not the implications that it has on business. Simultaneously, the literature has discussed the prospects of OTA platforms and their connections to consumer satisfaction but has not shown how it can help develop sustainable tourism.

Research Methodology:

As the study aims to understand the different innovations that can facilitate sustainable tourism, a secondary qualitative method of data collection and analysis has been chosen. The data for this form of study has been collected from different peer-reviewed articles, journals and official websites to raise the authenticity of the research procedure. Furthermore, the use of secondary methods in this context will allow the research to explore different innovations and how it has impacted the sustainable tourism market in India. The collected data has been analyzed in the form of a thematic analysis to shed light on each of the elements and raise the satisfaction levels among the travellers.

Findings and Analysis

AI Booking Assistants and Chatbots in Sustainable Tourism

Improving user experience and satisfaction with the services is one of the top priorities of organisations in the tourism and hospitality sectors, chatbots can be found on many websites and mobile-based tourism applications. These chatbots can mimic human interactions and guide consumers through chat or voice assistance. OTAs are travel aggregators that communicate with potential consumers and help them in booking flights, vacation packages and hotel rooms. These AI booking assistants have been found to reduce

both the convenience and efficiency of consumers and increase their knowledge about the products of services that they are booking (Shawal et al. 2023). The OTA platforms also assist individuals with price comparisons on different platforms to help tourists book trips that are both cost-effective and sustainable. The ease of booking and ability to reach out to a large mass of people ensures that the services provide consumers with a personalized service (Arachchi et al. 2022). The use of technology allows organisations to replace costly human labour and thereby eliminate service concerns.

Many countries including India over the years have increased their investment in the tourism sector to make the services more reliable and convenient for the people. Studies have shown that hotels and other travelling services that have used OTA platforms have been successful in increasing their sales by almost 30%. The use of chatbots on these services enables organisations to respond to customer concerns in a much faster and more convenient manner (Arachchi et al. 2022). The convenience that chatbots and other AI-assisted services provide has been proven to increase consumer satisfaction as these methods reduce repetitive tasks and reduce service costs for organisations. The use of AI chatbots influences user confirmation and satisfaction, shaping the intentions of consumers and enhancing the services of the tourism sector (Li et al. 2021).

In India, OTAs are the quickest and most convenient method to acquire the greatest offers and book travels, consumers acknowledge how bookings with these methods can be made straight away without any form of wait time, the on-demand human support that chatbots provide is sustainable and efficient that provides consumers with a personalized experience (Arachchi et al. 2022). The reduction in operation cost for booking and other services directly benefits the organisation and helps with their efforts with sustainability, combining AI enables the company to utilize the power of predictive analytics to improve the efficiency of operations within the tourism sector

and use the resources possessed by the organisation more efficiently (Ma, 2024). Sustainability initiatives such as AI-driven solutions allow tourism organisations to engage with their guests in a better way to increase their satisfaction (Zafer et al. 2024). The AI power management systems in the organisation can adjust heating and cooling in the hotels as per the needs of the occupancy thereby saving on energy and enabling guests to be loyal to the services that are provided.

Use of Technology for Environmental Awareness and Satisfaction among Travelers

Over recent years, web-based OTA platforms such as Hotels.com, Expedia and OYO in India have started developing smartphone apps because of their ease and convenience. The value perception of the services and offers that the OTA platforms provide is critical towards determining the booking methods (Talwar et al. 2020). The OTA platforms can use their platforms to educate consumers about the quality of physical services which are made available at the travel destinations, and the social value of the applications can be utilized to further attract consumers. Organisations that provide online booking systems need to ensure that potential customers rebook and continue to use their services therefore the quality of service which is provided is significantly important. Customer behaviour and satisfaction towards products develop from their personal values and motivations, these platforms therefore need to understand the demographic interests (de Vries, 2022). The prior tourism and hospitality literature that has been analysed in this section shows the role which these applications can play in educating tourists and establishing values.

Studies show that although people underestimate the capabilities of the tourism sector and their ability to protect the environment, the OTA platforms can be used to raise cross-cultural awareness. Governing bodies have the responsibility to make sure tourism within the nation grows sustainably (Nirwana, 2019). The studies carried out in this section have already shown the potential which these web

and mobile-based tourism services provide, the travellers even before travelling can acquire full details about the environment and location. Providing travellers with education about sustainable tourism helps them understand the experience and provides them with the choice to improve business transactions (Kalgi, Talaulikar, & Pandey, 2023).

The OTA platforms can encourage their consumers to be involved in value co-creation and increase the level of consumer participation. Through collaboration with other businesses and consumers, the organisations can help generate services that are mutually beneficial for both the tourists as well as the local communities and organisations. By raising the tourist's knowledge about the local culture and practices, their experience can be improved. This can motivate them to leave positive reviews to further influence future tourists and shape their decisions about the organisations (Liu et al. 2023). Providing consumers with knowledge and education about the services is highly important to make them more engaged with the procedure.

OTA Partnering with Local Communities

The third and final innovation that the present research suggests is for OTA platforms to partner with local communities to design activities for tourists that are mutually beneficial and sustainable. Hotels in recent times have worked closely with the OTA platforms to increase their exposure (Chokuri, 2024). Developing strategies to strategically partner with hotels and other travel travellers can be a key to success. OTAs provide economic scope for the local populations, the different business models and smart business practices can be used by organisations to their advantage to increase their opportunities and capture economic value. The purpose of the OTA platforms is to enhance the experience of the tourists and provide them with the best possible service, smaller and eco-friendly hotels do not always have the necessary resources to advertise themselves, so the OTA platforms can use their support and connections for distributing hospitality products and services (Wisker, 2020).

OTAs partnering with the local communities and small businesses can increase the exposure of this business and increase booking more services. The NGOs and governing bodies do not often possess a detailed understanding of the services e-commerce aspect within the different locations, OTAs with their connections with local hotels can help towards community development. Community-based tourism has significantly gained traction over the years as it can significantly boost the quality of life and living standards of the local communities in the region and create employment opportunities (Nova, 2021). Understanding and collaborating with the communities around tourism development therefore becomes important.

For the long-term support of eco-friendly and sustainable tourism practices, support from the local communities is highly necessary. Therefore, as it can be seen OTA platforms and local communities both need to establish long term sustainable relationships with each other as it can help both sectors strategically improve their services and potential (Garcia, Dos Anjos & Doğan, 2022). The local communities in the less crowded tourism locations are generally poor and reliant on cultivating and raising livestock, this form of strategic connection with OTA will help them in advancing themselves, gain education and have better chances of securing better jobs. The innovative measure is therefore for OTA platforms to help local communities get self-help and more reliant, this form of support is beneficial for both the environment and raises trust and support among the tourists.

Limitations of the study:

The present research sheds significant light on the different platforms OTA platforms have caused and the different measures through which tourism has been made more sustainable in recent times. The limitation is that the data for this research was only from secondary sources. Challenges were also faced in accessing information from secondary sources as many of them were locked behind paywalls.

Conclusion

As concluding remarks for the present research the study has discussed the potential which OTAs bring in making the tourism sectors more sustainable, the study has discussed the positive attributes of chatbots and other AI-assisted services that are available in the OTA platforms which help the consumers make better decisions while booking, these services provide additional information about the tours and prospect that they bring. The study also finds that this form of innovative technology compares the prices of several tourism packages and enables the consumer to choose the best possible packages that are fit for their usage.

The introduction of web and mobile-based technologies has also been assessed, these technologies increase the environmental awareness of the tourists and provide them with education about the local culture and practices for value creation and setting expectations for their tour. When the OTA platforms provide people with an immersive experience, it increases their satisfaction with the services. Finally, the prospects of OTA platforms supporting local communities have also been analysed within this section and how strategic partnerships can increase their employability. The researched innovations are only a fraction of the possibilities that OTA platforms have launched, this technology can further be used for exploring other sustainable travel offers. Sustainable tourism can only take place when the consumers are educated about its importance.

Recommendation

- ◆ The OTA platforms need to understand consumer desire and design sustainable travel choices for consumers who are considerate about the environment and want to make a change.
- ◆ The local collaboration aspect with sustainable tourism is still in its early stage, the OTA platforms can encourage consumers

to opt for more opportunities which travel to the local destinations. The local providers can work closely with hotel staff to enlist activities and other local attractions for travellers.

- ◆ The AI-based technologies which the OTA platforms use can be used to suggest to the consumers less crowded regions that are viable for the visitors. The offbeat locations and partnership with local hotels and resorts will ensure that the consumers experience an authentic experience.
- ◆ While the OTA platforms have options to educate travellers about greener travel choices, these can further be increased to raise transparency and help consumers understand how they can help generate less CO2 during travel.

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**'A CRITICAL STUDY ON ROLE, INITIATIVE OF INDIAN BANKS IN THE
CONTEXT OF GREEN BANKING PRACTICES'****Dr. Dipak Y. Chacharkar***

Abstract

Purpose: This paper aims at examining the current environmental status of commercial banks in India. In particular, the research attempts to identify initiatives that Indian banks undertake to reduce their carbon footprints and the drivers that influence these banks to act environmentally.

Design/methodology/approach: To achieve these objectives, researcher interviewed 27 randomly selected individuals with varied positions from managing director to branch manager using a semi structured questionnaire.

Findings: The interview reveals some important findings: (1) Banks' environmental initiatives that reflect their day-to-day activities are limited to recycling and reducing paper and energy consumption (2) although most banks think that eco-projects can be effectively implemented through the banking system, this opportunity remains largely untapped so far (3) Banks under study identify the need for separate guidelines issued by the regulatory authorities for environmental initiatives and disclosure.

Social Implications: The SPACER Model developed highlights initiative on Support, Product, Audit, Collaborations, Education and Rewards can bear out the Green Banking. Also 'DYC's Comprehensive Structural Model of Green Banking' can be useful tools assess the overall progress of banks in this regard.

Originality/ Value: The result of this research will help policymakers formulate appropriate environment regulatory policies required for mitigating carbon footprint in India.

Keywords : Green Banking, Green Banking Practices, Green Banking Model, Green Initiatives, Green Banking Index

Introduction

The banking sector is crucial to a nation's economy, exemplified by India's Reserve Bank and various banks. Non-banking financial institutions are also gaining importance. "Green Banking" emphasizes sustainable practices and reducing the carbon footprint through technology and eco-friendly client initiatives. Banks are adopting green initiatives that benefit the environment, with trends promoting sustainable technologies like green credit cards and mortgages while minimizing paperwork.

◆ Road Map to Green banking

The main goal of green banking is to promote

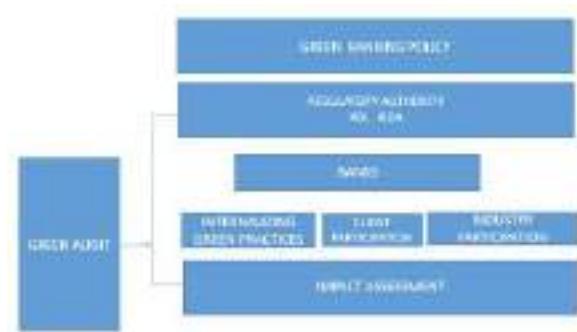
sustainable practices and lower the carbon footprint of banking operations. This includes offerings like Green Products and Services, Online and Mobile Banking, Green Deposits, and eco-friendly Credit Cards. This study examines these initiatives.

A conceptual framework (Fig. 1) outlines the elements of Green Banking Initiatives, starting with a Green Policy enforced by a Regulatory Body. Banks should internalize green initiatives, engage customers, collaborate with the industry, and conduct regular Green Audits and Environmental Impact Assessments. This research focuses on the green banking practices of Indian banks and

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Non-Banking Financial Institutions, highlighting efforts to reduce carbon footprints and the motivations behind environmentally responsible actions.

See figure 1. **Figure 1 Conceptual Framework of Green Banking**



◆ **Research Question:**

1. What are the key drivers behind the adoption of green banking practices by Indian banks and Non-Banking Financial Institutions?
2. How do green banking initiatives, such as eco-friendly credit cards and online/mobile banking, contribute to reducing the carbon footprint of the banking sector?
3. What is the role of regulatory bodies in promoting green banking practices among banks and Non-Banking Financial Institutions in India?
4. How do green audits and environmental impact assessments influence the adoption and effectiveness of green banking practices in Indian financial institutions?

◆ **Importance of the Topic**

The importance of this study lies in its contribution to understanding the role of the financial sector in addressing environmental concerns. Green banking initiatives are crucial for mitigating climate change, conserving natural resources, and promoting sustainable development. The Indian banking sector, with its vast reach and influence, plays a pivotal role in driving this transition toward a more sustainable financial system.

◆ **Approach**

To attain these parameters researcher has conducted survey of banks and Non-Banking Financial Institutions. Researcher collected data through the structured questionnaire from representatives of banks working on different positions from Manager to other senior positions.

◆ **Contributions**

This study aims to make significant contributions to the understanding of green banking in India. The key contributions include:

- Insights on the current state of green banking in India: Providing a comprehensive overview of the green banking landscape, including the level of adoption, the types of initiatives implemented, and the challenges faced by banks.
- Recommendations for banks and policy-makers: Offering evidence-based recommendations for banks to further enhance their green banking initiatives and for policymakers to create a more conducive regulatory environment for green finance.

Literature Review:

- Chubey, et.al, (2022) note that banks rarely assesses the carbon footprint of their projects and lack systematic documentation of corporate social responsibility (CSR) activities. Furthermore, employees often lack awareness of green initiatives. Factors like bank size, reputation, and age, profitability, and investor reactions influence their sustainability performance.
- Gunawan et.al, (2022) this research examines the sustainability and performance of green initiatives in Indonesia's banking sector over nine years of sustainability reports. Findings reveal significant year-to-year variability, with economic disclosures being the most common and environmental disclosures the least. Using content analysis and integrating Global Reporting Initiative (GRI) guidelines

with the green banking practices framework by Shaumya and Arulrajah (2016), the study creates a comprehensive disclosure criteria list. It recommends developing an indicator database for improved sustainability measurement and reporting, and emphasizes the need for banks to establish sustainability governance to effectively manage economic, environmental, social, and governance (ESG) risks.

- Vietnam (2018) Many banks globally, including in Vietnam, are prioritizing green credit initiatives, halting financing for brown projects and offering loans for solar panel installations. For example, Standard Chartered Plc. has committed to the Paris Agreement by stopping financing for new coal-fired power plants worldwide.
- Bose et al, (2018) The Green Banking Disclosure Index (GBDI) is the study's dependent variable, created based on regulatory guidelines for green banking disclosures. It comprises 21 items, including environmental policies, climate change awareness, a climate change fund, green branches, marketing initiatives like "Plant a Tree, Save the Environment," and dedicated sections in annual reports.
- Mehedi, et.al, (2017) Bangladesh banks are promoting green initiatives via credit/debit cards and online banking, with a focus on supporting tree planting and awareness campaigns. Research identifies five key factors influencing the adoption of green banking practices, accounting for 57% of the persuasive power based on bankers' perceptions. The study involved six groups, including bank personnel, government staff, and members of professional organizations like ICAB, ICMAB, BSEC, DSE, and CSE.
- Biswas, Debasish, (2016) Green Banking Strategies: Engage stakeholders to raise awareness of environmental challenges. Communicate sustainable banking benefits. Conduct energy audits and assess equipment policies. Analyze IT operations for sustainability. Set SMART objectives to reduce carbon footprint and track progress. Develop a

green policy to enhance efficiency and minimize harm. Inspire employees and encourage clients to adopt sustainable practices. Monitor progress, stay updated on trends, and adjust the policy as needed. Promote initiatives for community recognition.

Research Methodology

◆ Research Gap

A researcher has found that while many studies focus on the adaptability of green banking systems, there is a lack of comprehensive research on green banking in India. The adoption of green banking products by customers depends on banks internalizing these practices. This has created a gap between banks' operational practices and their adoption by clients and society. Additionally, banks' information and achievements are not easily accessible to the public. In response, the researcher has launched a study titled "A Critical Study on the Role and Initiatives of Indian Banks in the Context of Green Banking Practices."

◆ Objects of the study:

The research is conducted on the following objects

1. To know the awareness and initiative on Green Banking
2. To study and analyze the Green Banking practices at different level
3. To develop model for the Green Banking.

◆ Research Design

Researcher used Descriptive Research design to generate findings that are practically useful in reaching conclusions or decision-making.

◆ Sampling Technique:

Non-Probability Convenience Sampling

Sample Unit: Representatives of different banks (Private, Public and Non-Banking Financial Institutions)

Sample Size: used 27 sample

◆ **Data Collection Techniques**

Data was collected from both secondary and primary sources. Structured questionnaire was used for primary data collection. For data collection 'Google Form' was used. Forms forwarded to 50 plus respondents, and are responded by 27 respondents.

◆ **Analytical Procedure:**

Researcher used simple statistical bi-variate analysis tools and multivariate tools like Cluster analysis, etc. Tables and statistical results have been derived through SPSS version 26. Statistical techniques like, 'ANOVA', 'Cluster Analysis', Principal Component Analysis, etc. have been employed.

involved in the survey include Barclays Bank, HDFC, Kotak Mahindra, ICICI, AXIS, IndusInd, HSBC, Union Bank of India, SBI, PNB, Bank of Maharashtra, Sahayog Cooperative, Akola District Central Cooperative, Bajaj Housing Finance, and Bhartiya Yuva Shakti Trust. The average experience of the respondents in the field is approximately 10 years. This section presents the overall responses collected from the participants in the study, utilizing various scales tailored to the specific focus areas of the research topic.

1. Green banking individual's perception
2. Green banking practices of the banks in day-to-day activities
3. Green banking practices at Client and Societal Level
4. Green banking product and Services
5. Other achievements.

Observation, Findings and Data Analysis:

◆ **Respondents Profile (PART I)**

A total of 27 respondents participated in the survey conducted by the researcher. The banks

◆ **Bank's Green Initiative Individual's Perception (Part II)**

Cronbach's Alpha Value

Reliability Statistics	
Cronbach's Alpha	N of Items
.910	7

The reliability statistics value 0 .910 indicates reliability of 7 scales together which is very significant

Sr. No.	Description	SA	A	N	DA	SD	Total
1	Our bank involves green chores	16	9	2	-	-	27
2	Our bank undertakes its green corporate social responsibilities	15	10	2	-	-	27
3	Our bank considered as the best benchmark of environmental commitments	14	9	4	-	-	27
4	Our bank is professional When it comes to environmental reputation	15	12	-	-	-	27
5	Our banks have succeeded in its environmental performance	18	9	-	-	-	27
6	Our bank initiates several actions which proves its establishment towards environmental concern	13	12	2	-	-	27
7	Our bank keeps promises and commitments towards environmental concerns	13	12	2	-	-	27

The table above indicates that a majority of respondents express agreement with the statements regarding the bank's Green Banking initiative.

Nevertheless, the subsequent paragraphs reveal that the banks are lacking in their overall readiness to address this issue.

◆ **Green Banking Practices at Operational Level (Part III)**

Cronbach's Alpha Value

Reliability Statistics	
Cronbach's Alpha	N of Items
.935	7

The reliability statistics value 0.935 indicates reliability of 7 scales together is very significant.

Sr. No.	Description	Existed	In Progress	Now policy is designed	Now in consideration	No Plan	Total
1	Bank Committed to minimize paper waste by promoting internal communication through e –Communications tools, use of double-sided printouts and recycling paper, etc.	18	9	-	-	-	27
2	Bank have/plan to setup green branches.	9	11	1	4	2	27
3	Bank have/plan to setup 'Climate Change Fund'.	10	10	-	1	6	27
4	Bank have published its "Environment Policy" and its is known to the all concern	12	6	-	4	4	27
5	Bank every year conduct "Environment Audit".	8	9	1	5	4	27
6	Bank offer training to its employees on "Green Banking Practices"	11	11	1	2	3	27
7	Bank annual report had included its "Green Banking Practices"	15	5	1	3	3	27

Responses on bank's initiative on Green Banking Practices at operation level are given in the table above. It can be seen that some banks are well prepared on this front; few other banks are in progress or in the process of developing policy regarding the same. And some other does not have

any Green Banking policy at its place. When data is cross tabulated further it is observed that most private banks are doing well on it, public sector banks are in the developmental stage and other non-banking financial institutions are absolutely having no plans on this front.

◆ **Green Banking Practices at Client and Societal Level (Part IV)**

Cronbach's Alpha Value

Reliability Statistics	
Cronbach's Alpha	N of Items
.921	7

The reliability statistics value 0.921 indicates reliability of 7 scales together is very significant.

Sr. No.	Description	Always/ Existed	Most time/ In Progress	Some time/ Now policy is designed	Rarely/ Now in consideration	Never/ No Plan	Total
1	E I A Report Submission	11	4	5	3	4	27
2	Plan for green Concern	10	7	5	1	4	27
3	Support Projects	13	7	3	2	2	27
4	Support Green Initiatives	15	4	3	4	1	27

Sr. No.	Description	Always/ Existed	Most time/ In Progress	Some time/ Now policy is designed	Rarely/ Now in consideration	Never/ No Plan	Total
5	Training, Workshop Organizations	12	7	5	-	3	27
6	Bank Promotion Material	14	6	1	2	4	27
7	Tie-Ups	14	6	2	2	3	27

A majority of respondents who expressed a favorable view on the submission of EIA Reports by loan applicants demonstrated a commitment to environmental sustainability. They indicated support for green projects and initiatives, provided training to various stakeholders, developed promotional materials for banks that conveyed a

green message, and established partnerships with organizations dedicated to environmental causes. Further analysis reveals that private banks are performing well in this area. Conversely, the data indicates that the negative responses primarily originate from public sector banks and other institutions, as illustrated in the table above.

◆ **Green Banking Product and Services (Part V)**

Cronbach's Alpha Value

Reliability Statistics	
Cronbach's Alpha	N of Items
.902	5

The reliability statistics value 0.902 indicates reliability of 5 scales together is very significant.

Sr. No.	Description	Always/Existed	Most time/In Progress	Some time/ Now policy is designed	Rarely/ Now in consideration	Never/ No Plan	Total
1	Green Mutual Funds	15	3	5	-	4	27
2	Discounts	11	4	4	3	5	27
3	e-statements	15	7	3	-	2	27
4	Co-Branding	13	6	1	3	4	27
5	Investment fund	13	7	2	-	5	27

The majority of respondents expressed a favorable view regarding the provision of green products and services by banks. Specifically, these offerings include mutual funds, interest discounts for green projects, the issuance of e-statements to customers, partnerships with environmentally responsible organizations, and investment op-

portunities in green funds. As previously noted, private banks are performing well in this area. In contrast, the data presented in the tables indicate that negative feedback primarily originates from public sector banks and other institutions included in the study.

◆ **Green Banking Other Details (Part VI)**

Sr. No.	Description	Yes	No	Total
1	Budget Allocation	20	7	27
2	Awards and Recognition	10	17	27

The reliability statistics value 0.902 indicates reliability of 5 scales together is very significant.

Respondents were requested to document their budget allocations for Green Banking initiatives and any awards received in relation to these efforts. A total of 20 respondents confirmed their budget allocations, while 10 acknowledged receiving awards and recognition. However, many respondents lacked specific details on these matters. There exists some uncertainty among the respondents regarding whether the allocated funds are exclusively for Green Banking activities. This suggests a limited level of concern or interest in Green Banking among the stakeholders.

Classifying Banks Based on Green Practices

The data gathered through a structured questionnaire has been further analyzed using ANOVA and various multivariate statistical methods, including Cluster Analysis and Principal Component Analysis. The findings are detailed in the following sections. Cluster analysis is employed to explore the potential for classifying banks according to their green practices, with additional support from ANOVA. Principal Component Analysis is also utilized to create an index and estimate tertiles.

Classification of Banks Based on Green Practices: Cluster Analysis

The researcher engaged with 27 banks to gather data pertinent to the study's objectives. K Means cluster analysis was applied to categorize the banks based on their overall scores. Refer to Table 1 and Table 2 for detailed results.

Table1. Number of Cases in Cluster

Number of Cases in each Cluster		
Cluster	1	4.000
	2	6.000
	3	17.000
Valid		27.000
Missing		.000

Table2. Final Cluster Centers

	Final Cluster Centers		
	Cluster		
	1	2	3
II1	4.00	4.17	4.76
II2	4.00	3.83	4.82
II3	3.75	3.83	4.71
II4	4.00	4.50	4.71
II5	4.00	4.00	4.53
II6	3.75	4.17	4.65
II7	3.75	4.17	4.65
III1	4.75	4.33	4.82
III2	2.00	3.00	4.47
III3	1.00	2.83	4.53
III4	1.00	2.50	4.59
III5	1.00	2.50	4.41
III6	1.75	3.17	4.65
III7	1.75	3.00	4.82
IV1	1.75	3.17	4.12
IV2	2.50	3.00	4.06
IV3	1.75	3.50	4.71
IV4	1.75	3.67	4.71
IV5	1.75	3.33	4.65
IV6	1.00	3.33	4.76
IV7	1.75	3.00	4.82
V1	1.50	3.17	4.76
V2	1.25	3.17	4.12
V3	2.75	4.17	4.59
V4	1.00	3.17	4.65
V5	1.00	3.33	4.71
Bank Type	2.50	2.00	1.12

The scales II1...V5 are utilized for data collection, focusing on various broader parameters in the study, which include:

1. Individual perceptions of green banking
2. Daily green banking practices of financial institutions
3. Green banking initiatives at the client and societal levels
4. Green banking products and services
5. Additional accomplishments

Based on the cluster centers derived from all scales, banks are categorized into three distinct clusters:

Cluster 1 (Least Responsible Green Banks):

This cluster, characterized by low overall scores on the Likert scale across various variables, primarily consists of cooperative banks and other financial institutions.

Cluster 2 (Less Responsible Green Banks):

Banks in this category exhibit moderate scores on the scale, predominantly comprising public sector banks.

Cluster 3 (More Responsible Green Banks):

This cluster includes mainly private banks, which tend to score higher on most scales.

III5	22.562	2	.567	24	39.763	.000
III6	15.600	2	.644	24	24.209	.000
III7	18.871	2	.718	24	26.300	.000
IV1	9.659	2	1.640	24	5.892	.008
IV2	5.289	2	1.748	24	3.026	.067
IV3	15.110	2	.491	24	30.787	.000
IV4	14.675	2	.567	24	25.873	.000
IV5	14.943	2	.582	24	25.680	.000
IV6	24.137	2	.433	24	55.743	.000
IV7	18.871	2	.551	24	34.258	.000
V1	19.480	2	.704	24	27.677	.000
V2	13.696	2	1.556	24	8.801	.001
V3	5.483	2	.988	24	5.552	.010
V4	22.975	2	.613	24	37.471	.000
V5	23.272	2	.536	24	43.423	.000
Bank Type	3.988	2	.615	24	6.483	.006

One-Way ANOVA

The researcher employed One-Way ANOVA to assess the significance of the classifications established through K Means Clustering. This statistical method evaluates the significance level in categorizing banks based on the specified parameters. The findings are presented in Table 3 below.

Table3. Classifying the Banks Based on Scores on the Scales

	ANOVA					
	Cluster Mean Square	Df	Error Mean Square	F	Sig.	
II1	1.424	2	.329	24	4.331	.025
II2	2.718	2	.221	24	12.301	.000
II3	2.592	2	.380	24	6.826	.004
II4	.819	2	.210	24	3.906	.034
II5	.882	2	.176	24	5.000	.015
II6	1.526	2	.311	24	4.907	.016
II7	1.526	2	.311	24	4.907	.016
III1	.538	2	.190	24	2.835	.078
III2	12.216	2	.760	24	16.077	.000
III3	22.614	2	.795	24	28.462	.000
III4	25.450	2	.734	24	34.670	.000

Note: II1...V5 are scales used for data collection

All variables, with the exception of III1 and IV2, are statistically significant in classifying banks into different groups at the 5% significance level, as indicated by significance values of 0.00, which are below 0.05. Conversely, III1 and IV2 do not demonstrate statistical significance in this classification, as their values exceed 0.05. Therefore, it is reasonable to conclude that the variables utilized for classification are well-justified.

Construction of Green Banking Index: Estimation of Green Banking Tertiles

To develop the Green Banking Index, it is essential to gather all relevant indicators that reflect banks' environmental concerns. These indicators have been previously outlined. The Principal Component Analysis (PCA) is employed to construct the Green Banking Index. The results of the PCA are presented in the table below. PCA serves as a data reduction technique, and the index may vary based on the selected variables. The construction of the index necessitated several iterations to achieve the final results. Given that this index is a continuous variable, the researcher has recorded it into categorical variables for better

comprehension. Consequently, the PCA output has been categorized into three tertiles: 1 representing the least green banks, 2 for less green banks, and 3 for more green banks.

Table4. Principal Component Analysis (PCA) Output

Component	Total Variance Explained					
	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.485	55.711	55.711	14.485	55.711	55.711
2	3.124	12.015	67.727	3.124	12.015	67.727
3	1.919	7.382	75.108	1.919	7.382	75.108
4	1.362	5.237	80.345	1.362	5.237	80.345
5	.901	3.464	83.810			
6	.799	3.073	86.883			
7	.739	2.843	89.727			
8	.576	2.215	91.941			
9	.471	1.810	93.752			
10	.392	1.508	95.259			
11	.277	1.064	96.323			
12	.251	.967	97.290			
13	.195	.752	98.042			
14	.144	.553	98.595			
15	.103	.395	98.990			
16	.086	.332	99.322			
17	.064	.244	99.567			
18	.040	.152	99.719			
19	.027	.105	99.824			
20	.013	.050	99.874			
21	.013	.048	99.923			
22	.010	.037	99.959			
23	.006	.021	99.981			
24	.003	.013	99.993			
25	.002	.006	100.000			
26	4.548E-5	.000	100.000			

Extraction Method: Principal Component Analysis.

The table demonstrates that the overall data can be summarized into four essential factors. The leading factor represents 55 percent of the explained variance. This extraction of factors will be subjected to additional analysis aimed at reducing

tertiles. In the next stage, an index will be created based on the cumulative scores from all 26 scales employed in this analysis. The following table categorizes banks based on their scores, divided into three equal groups.

Table5: Tertile Classification of Respondents

		Percentile Group of FAC1_1			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	least green	9	33.3	33.3	33.3
	less green	9	33.3	33.3	66.7
	more green	9	33.3	33.3	100.0
	Total	27	100.0	100.0	

Table6. Indexing on the Basis of Overall Score on all Scales

Score Range	Least Green	Less Green	More Green
51-95	9	-	-
95-117	-	9	-
117-130	-	-	9

A total of 27 banks were analyzed and classified into three categories based on their Green Banking Total scores. The overall Green Banking Total is derived from the sum of values across all 26 assessment scales. The scoring system ranges from a minimum of 26 (1 point for each scale) to a maximum of 130 (5 points for each scale). Banks scoring between 51 and 95 are categorized as Least Green Banks, while those with scores from 97 to 117 are classified as Less Green Banks. Scores ranging from 117 to 130 indicate a More Green Bank.

Model Development

The researcher has also created the SPACER Model and 'DYC's Comprehensive Structural Model of Green Banking' to present the study's

findings succinctly. Refer to Figures 2 and 3 for visual representation.

SPACER Model

The SPACER Model developed by the researcher emphasizes the essential structures of Green Banking, which are elaborated in the accompanying figure. Please see the SPACER Model illustrated below.

Figure 2 SPACER Model

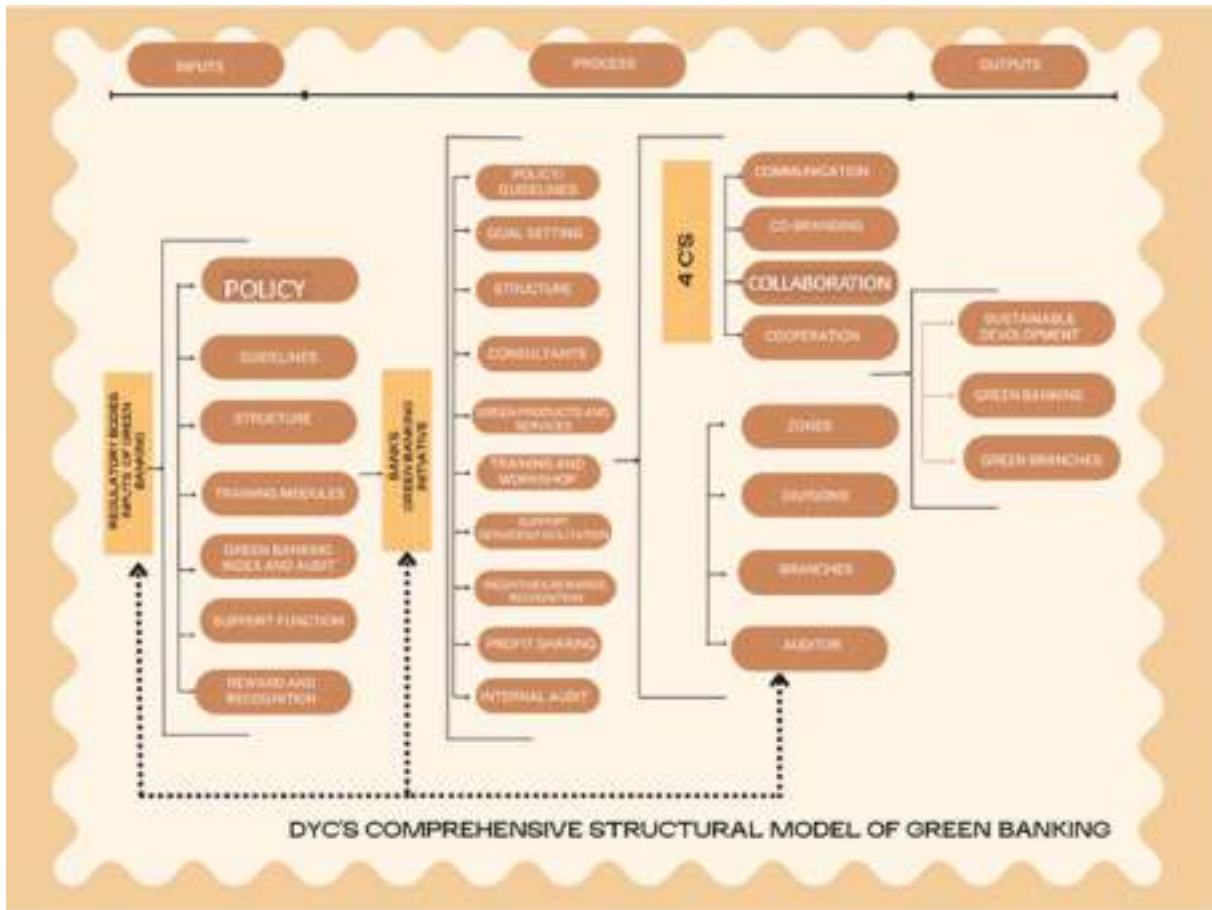


The SPACER Model serves as an extensive framework that emphasizes the importance of Support, Product, Audit, Collaborations, Education, and Rewards in promoting Green Banking. The various factors associated with Green Banking, as outlined in this model, can effectively evaluate a bank's overall advancement in this area.

'DYC's Comprehensive Structural Model of Green Banking'

The researcher has also created a structural model for Green Banking, referred to as 'DYC's Comprehensive Structural Model of Green Banking,' which is illustrated in Figure 3.

Figure 3 DYC's Comprehensive Structural Model of Green Banking



The overall model, as illustrated in Figure 3, is divided into three main sections: input, process, and output. The input section encompasses contributions from regulatory bodies, which may include policies, guidelines, structural frameworks, training modules, the Green Banking Index, audit mechanisms, support functions, as well as rewards, recognition, and incentives. Banks process these inputs according to their internal frameworks and may implement specific modifications to effectively incorporate them into their operations. Subsequently, banks develop customized policies, guidelines, structures, training modules, green products and services, internal audit mechanisms, support functions, rewards, recognition, and incentives, and may also engage consultants. A potential approach could involve sharing profits generated through green banking initiatives with employees, thereby fostering their engagement in the overall process. This mechanism is then ex-

tended to zonal offices, divisional offices, branches, auditors, customers, and the broader community. Stakeholder participation is crucial in this endeavor, and the 4C's approach will play a vital role. This approach includes communication with all stakeholders, collaboration with relevant organizations, cooperation with associated entities, and co-branding with environmentally responsible organizations. The ultimate outcome will be sustainable development, the promotion of green banking, and the establishment of green branches.

Results

- ✓ Green banking initiatives have been minimized to essential activities, such as reducing paper usage through technology and implementing energy-saving measures.
- ✓ Environmental projects are often de-prioritized.

- ✓ There is a lack of regulatory guidelines regarding green initiatives and voluntary information disclosure, leading to significant ambiguities in green banking practices.
- ✓ The banks examined show that their environmental efforts are primarily limited to recycling and minimizing paper and energy consumption.
- ✓ The banks believe that eco-friendly projects could be effectively integrated into the banking system, yet this potential remains largely untapped.
- ✓ The banks recognize the necessity for distinct guidelines from regulatory bodies concerning environmental initiatives and their disclosure.
- ✓ This research will assist policymakers in developing suitable environmental regulations aimed at reducing carbon emissions in India.
- ✓ While banks allocate funds for green banking initiatives, many respondents are unaware of the specific amounts designated for this purpose.
- ✓ The survey indicates that there are no standardized criteria for awards and recognition among banks, resulting in varied categorizations reported by respondents.
- ✓ The researcher has developed two models, the SPACER Model and DYC's Comprehensive Structural Model of Green Banking, which can serve as frameworks for establishing a green banking model.
- ✓ Using cluster analysis, banks have been categorized into three distinct groups: Cluster 1 - Least Responsible Green Banks, Cluster 2 - Less Responsible Green Banks, and Cluster 3 - More Responsible Green Banks, which serves as a valuable tool for assessment.
- ✓ The Green Banking Index is developed by compiling scores from 26 distinct metrics, yielding an overall score that varies from 26 to 130. This index is categorized into three groups. Banks that score between 51 and 95 are identified as least green, while those with scores ranging from 97 to 117 are classified as less green. Banks that attain scores from 117 to 130 are regarded as greener. This index

functions as a means to evaluate a bank's dedication to Green Banking practices.

Suggestion

1. Formulating a policy statement by regulatory authorities to provide direction for banking institutions.
2. Establishing Green Branches.
3. Conducting regular Green and Environmental audits.
4. Implementing recognition and reward systems at the branch, district, and zonal levels.
5. Requiring the disclosure of green initiatives in annual reports.
6. Creating an index to track advancements in Green Banking.
7. Engaging in Communication, Co-Branding, Collaboration, and Cooperation (the 4C's) to promote Green Banking to the broader community and society.

Study Limitations:

The current research focused on a select number of private and public-sector banks, as well as non-banking financial institutions. Additionally, the examination of the roles and responsibilities of regulatory bodies was conducted to a limited degree. Several significant and successful green banking models and indices were also analyzed only superficially.

Future Research Opportunities:

The researcher identified substantial potential for a more comprehensive investigation into green products and their adoption among the general public. The study of regulatory body initiatives is also being considered for the next phase of research. Furthermore, there are plans to enhance the existing index in the upcoming research phase.

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**BRIDGING THE GENDER GAP IN THE MANUFACTURING SECTOR FOR
SUSTAINABLE LEADERSHIP: A CONCEPTUAL FRAMEWORK FOR
ENHANCING AI SKILLS AND SPONSORSHIP FOR WOMEN****Sreekala, Shyla Krishnakumar and M. Sulaipher***

Abstract

Manufacturing companies are competing with each other to build an inclusive workforce at all levels at the same time leveraging technology to optimize processes through effective automation. This has resulted in the growing demand for professionals with technical skills for all strategic roles in management and engineering at manufacturing firms. Research shows that when women are appointed to top management positions, such as CEOs and CFOs, companies are more likely to focus on green innovation due to women's heightened sensitivity to environmental issues (e.g., Nadeem et al., 2020). However, data shows that women make up only 16% of applicants worldwide, while men make up 84% in the technology-driven manufacturing industry, where diversity and inclusion are essential for achieving sustainable goals (Stanford Social Innovation Review; Boell Aviv). But the reality is that men and women do not have equal opportunities to upskill in the job, which significantly contributes to this disparity. To tackle this problem, this study suggests a conceptual framework based on the intersectional theory and upper echelons theory. It examines the relationship between several elements and the advancement of women into leadership positions. The study uses the structural equation Modelling to investigate and test the complex relationships between different factors that either help or impede women's advancement to leadership positions in manufacturing industries. The results of the research conducted with the suggested framework might assist businesses in creating plans to lessen the gender gap in upskilling. The proposed framework can help companies identify and test factors contributing to inclusive leadership, ensuring that more women reach leadership positions. This approach also tends to support green innovation, prioritizing sustainability goals. In conclusion, bridging the gender gap in upskilling in manufacturing is crucial for both gender equality and sustainable leadership.

Keywords : Sustainable leadership, Gender Diversity, Green Innovation, Workforce Inclusion, Leadership Gap in AI, Gender Disparity in Manufacturing Leadership

Introduction

Leadership roles in core production and manufacturing industries are not only highly lucrative and innovative but also among the most highly paid globally. The recent advent of AI and other technological disruptions has significantly propelled this sector forward. The global smart factories market was valued at \$129.74 billion in 2022 and is expected to reach approximately \$321.98 billion by 2032, growing at a CAGR of 9.52% from 2023 to 2032. The manufacturing sector currently contributes 17% to the global GDP, with projections indicating a potential increase to 21% within the next

six years.

Despite the deployment of scalable process automation in warehouses, production plants, and assembly lines, the sector faces a significant demand for AI-skilled professionals in mid to senior management roles in the coming years. Currently, the manufacturing industry employs 455 million people, constituting 13% of the global workforce (Deloitte, OECD). Of these, 318.5 million are men, and 136.5 million are women, highlighting a substantial gender disparity in an era where inclusion and gender equality are crucial for sustainable employment.

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A troubling reality is that, despite the growing demand for AI expertise in manufacturing industries, women represent only about 16% of AI aspirants worldwide, with men accounting for the remaining 84% (Stanford Social Innovation Review; Boell Aviv). Research indicates a significant bias in mentoring and sponsorship opportunities for women in leadership roles within the production and manufacturing sectors.

This paper aims to study the key barriers contributing to the underrepresentation of women in manufacturing leadership roles and other business sectors based on existing literature. It focuses on the technology and AI skills gap between women and men, as well as the gap in mentoring and sponsorship. Based on these findings, the paper proposes practical methodologies that industries can adopt with minimal investments to reduce these biases across sectors. These recommendations aim to foster a more inclusive and diverse workforce, aligning with sustainable workforce development norms.

Literature Review:

The Upper Echelons Theory suggests that the unique attributes, such as cognitive foundations and values, possessed by senior executives within a company significantly impact the formulation of strategic choices and subsequent organizational performance. These executives' cognitive backgrounds and values influence their perceptions of strategic scenarios, guiding decision-making processes and affecting both market and financial performance measures. The manufacturing industry requires substantial transformation to address disruptive environmental, social, and economic challenges, necessitating a highly skilled workforce (Braun et al., 2023). Institutions are pivotal centers for sustainable development to drive progress (Hosseini et al., 2020). However, women remain underrepresented in leadership across industry sectors, business, education, and politics (International Labour Office, 2022; McKinsey & Company, 2019; UN Women, 2023). This underrepresentation creates talent shortages and recruit-

ment challenges, underscoring the critical need to empower the existing workforce, particularly women (M. Petridis et al., 2021). Numerous factors contribute to this unequal representation of women in senior management and other demanding careers. Research consistently shows positive correlations between gender diversity on boards and corporate performance (Catalyst, 2004, 2013; Dawson et al., 2014; Ernst & Young, 2016; Galbreath, 2011; Kramer et al., 2006; World Bank, 2015). Madsen (2015) provides evidence that organizations benefit from having women on boards and in top leadership roles, enhancing financial performance, organizational climate, corporate social responsibility, reputation, talent leverage, innovation, and collective intelligence. Women bring educational values and communication qualities that help boards better represent diverse stakeholder interests (Liu, 2018; Nadeem et al., 2020) and support environmental sustainability (McGuinness et al., 2017). Studies also indicate that women possess characteristics that make them effective transformational leaders adept at navigating change with their teams (Bruckmüller & Branscombe, 2010; Ryan & Haslam, 2009). During challenging times, women are often selected for leadership roles due to their inclination to assist those most in need, their more rational risk assessment compared to men, and their ability to handle failure more constructively (Ryan et al., 2011, pp. 470-484). Despite these competencies, research shows that women are frequently perceived as less competent and qualified than their male counterparts, even when their qualifications are equal (Campbell & Hahl, 2022; Heilman, Caleo, & Manzi, 2024), making it challenging for women to advance to leadership positions and contributing to their underrepresentation. In the era of inclusion and sustainability, women are often judged more critically than men for the same behaviors and are more likely to be viewed as less competent and qualified (Ayinla et al., 2024; Reby et al., 2022). McKinsey's 2021 research found that women's jobs are now twice as vulnerable as men's to the economic repercussions of the pandemic (McKinsey, 2021). The appointment of women to top management positions, such as

CEOs and CFOs, is likely to promote firms' green innovation due to their heightened sensitivity to environmental issues (e.g., Nadeem et al., 2020) and corporate social responsibility (CSR) concerns (e.g., Harjoto et al., 2015; Naciti, 2019). Despite the crucial role of green innovation in fostering firm sustainability, studies on the impact of board feminization on green innovation remain relatively sparse (Nadeem et al., 2020; Farza et al., 2022; He & Jiang, 2019). According to leading survey institutes, a major factor contributing to gender disparity in leadership roles is the technology skills gap in the AI-dominated era. Digitalization of an organization's macro environment and digital upskilling and human capital's micro-level digital capital formation present women with opportunities to advance in various job roles and leadership. Every effort by women to overcome the digital divide in digital capital formation enables women to harness leadership qualities (Thomas et al., 2024). Upskilling bridges the digital divide, advocating inclusive and accessible learning opportunities to nurture a diverse and globally competitive workforce (Ajayi et al., 2024). Ensuring responsible and inclusive AI and automation deployment in the workplace necessitates proactive policies, stakeholder collaboration, and ongoing learning and adaptation (Hieu et al., 2024). However, data from the World Economic Forum and other reputable sources indicate that women face significantly fewer opportunities and less motivation than men to acquire new technology skills in the workplace. This knowledge gap is particularly pertinent for leadership roles in today's AI-driven landscape. Research also shows a significant disparity in sponsorship and compensation for women compared to their male counterparts, despite women in middle management making substantial contributions to business growth. Women often lag behind men in career advancement because they tend to have mentors rather than sponsors. In contrast, men generally have greater access to sponsors—senior leaders with power and influence who advocate for them—explaining why men receive more promotions than women (Ibarra, Carter, Silva,

2010). This discrepancy can cultivate self-doubt and self-deprecation mindsets among women, who often question their abilities more than men (Ehrlinger & Dunning, 2003). To significantly increase the number of women leaders globally, we must prioritize career sponsorship now rather than later. Sponsorship programs not only provide women with platforms for personal development and organizational hierarchy progression but also enable organizations to address the persistent issue of inadequate women leaders (Jovina Ang, 2018). On average, women receive higher performance ratings than their male counterparts but are given 8.3% lower potential ratings than men. Consequently, female employees are 14% less likely to be promoted than their male colleagues (Benson & Li, 2022). In light of these findings, industries must address this bias and establish a sustainable leadership framework ensuring equal opportunities for women to learn, advance, and be promoted to leadership roles.

Research Methodology & Data Analysis:

Research Methodology:

This study employs a combination of Upper Echelons Theory and Intersectional Theory to propose a conceptual framework that can verify the various causes of the underrepresentation of women in leadership roles within manufacturing firms and to suggest factors of improvement for achieving enhanced inclusivity towards green innovation. The proposed framework extensively utilizes the Upper Echelons Theory's conceptual model to examine why there's a gender gap in leadership roles in manufacturing firms. According to this theory, the way senior executives think and their values, which are reflected in their demographics like age and education, greatly influence their strategic decisions, which in turn affect the performance of the organization. The instances from the model is utilized in the proposed model to study the causes of underrepresentation of women to leadership roles in manufacturing industries.

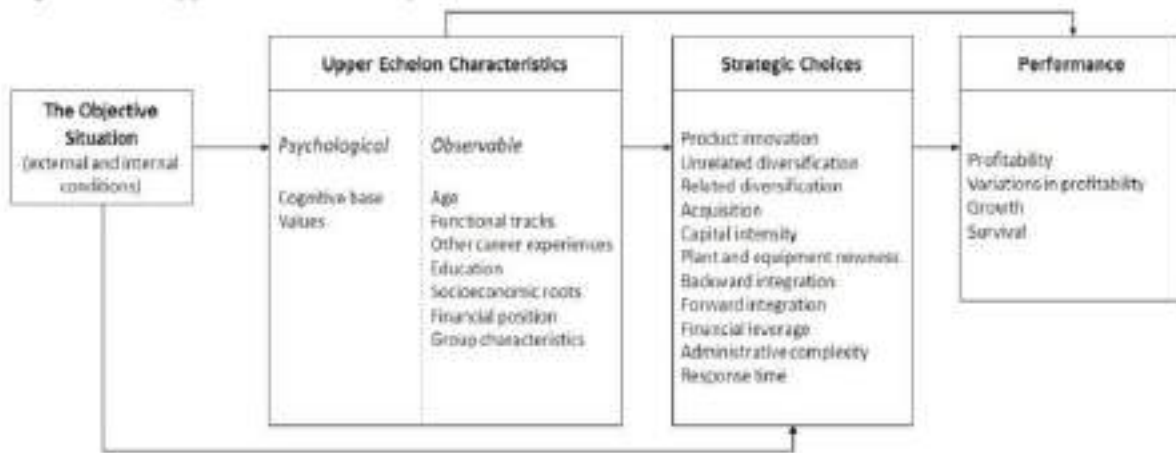


Fig 1: The Upper Echelons Conceptual Model

Quantitative analysis is preferred to conduct the research, and the result analysis will be conducted according to the proposed conceptual framework. A survey questionnaire comprising 15 questions will be distributed to 150 women participants who occupy the leading roles in various sectors, and responses will be collected and recorded for analysis. The questions are designed in such a way as to measure the bias and hindrances the women face in upskilling themselves as compared to their male counterparts, which is the primary reason researchers state behind the slow pace of the leadership journey.

Data Analysis

The primary objective of the analysis is to measure the influence of multiple variables on women's growth as leaders in manufacturing industries. The foundational theory's insights provided the basis for the conceptual framework, and the important variables were selected from the body of literature that addresses the scenarios that both promote and hinder women's advancement in the industrial industry. From the broad literature addressing the underrepresentation and slow progress of women in leadership roles, the very significant variables were carefully chosen, and so was the research design to ensure the modularity of the proposed framework for any similar kind of study.

The proposed conceptual framework suggests

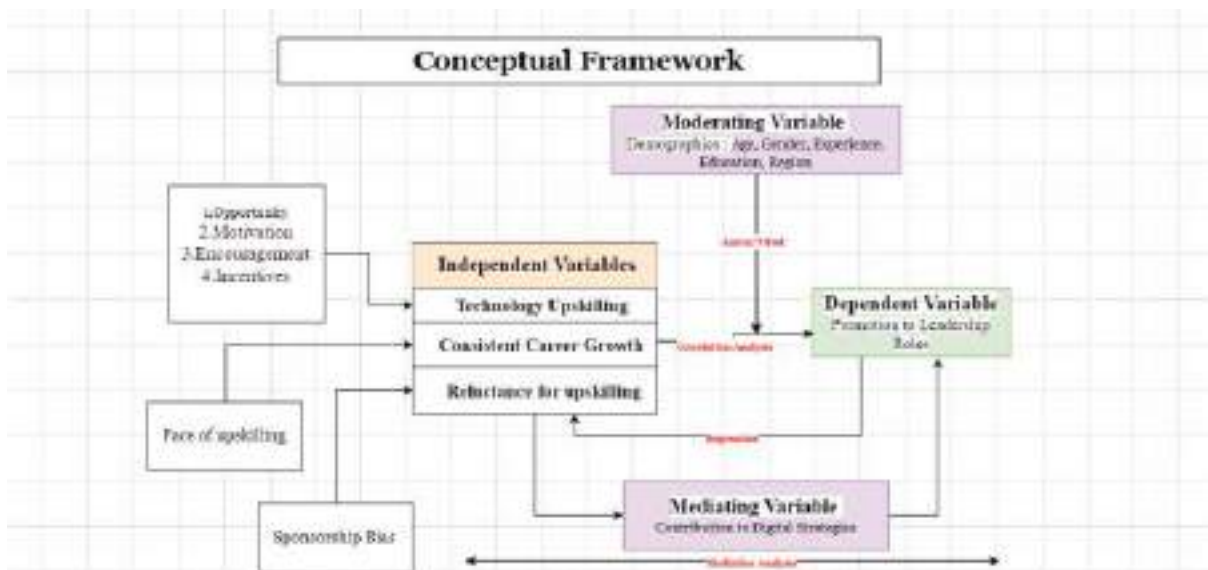
structural equation modeling to establish multiple cause-and-effect relationships between the various dependent and independent variables and AMOS to analyze the structural models and their fitness. Apart from identifying the direct cause factors and their effects on the promotion of women to leadership roles in manufacturing industries, to strengthen the analysis, the framework recommends mediation and moderation analysis with the help of the Process Macro option in SPSS software.

From the existing corpus of women in leadership at manufacturing industries, technology upskilling, and consistent career growth are found to be the most favourable for the promotion of women to leadership roles, whereas women with reluctance to upskill are very less likely to get promoted to leadership roles. Therefore, research identifies technology upskilling, consistent career growth, reluctance for upskilling, and promotion to leadership roles as the dependent variables. For the ease of testing multiple cause-and-effect relationships all at once, SEM models are tested in AMOS. Opportunity, motivation, encouragement, and incentives are independent variables, and their effect on technology upskilling is tested. The effect of the pace of upskilling on consistent career growth and the effect of sponsorship bias on reluctance for upskilling are tested. Now the effect of technology upskilling, consistent career growth, and reluctance for upskilling on promotion to a leadership role is tested. The fitness of the SEM model will clearly indicate those that

have the highest effect on the promotion to leadership roles and the factors that can be improved upon to upscale the pace of women to leadership roles. Research indicates that women in manufacturing who actively participate in strategic decision-making in their mid-management positions are more likely to be promoted to leadership roles faster than those who primarily handle technology tasks at their desks. Therefore, the framework examines whether women's involvement in strategic decision-making acts as a factor that influences promotions to leadership roles. Consequently, we propose conducting a mediation analysis to ex-

plore how women's contribution to digital strategies mediates both dependent and independent variables.

To further strengthen the analysis, moderation analysis is conducted on the moderating variable, the demographics, which include age, gender, experience, education, marital status, and region, and its effect on the promotion of women into leadership roles. This framework moreover covers all the essential supportive and hindering parameters that manufacturing industries can apply to grow women's leadership at a much faster pace.



Findings:

Promoting women into leadership roles in AI-dominated manufacturing and other industries is crucial for driving innovation and sustainability. Currently, women constitute only 16% of AI aspirants worldwide, indicating a significant skills gap that needs addressing. Research shows that diverse leadership teams, including more women, enhance decision-making processes and boost organizational performance. Companies with gender-balanced leadership are also more likely to innovate and adapt to technological disruptions effectively.

Moreover, women leaders tend to prioritize environmental sustainability and corporate social responsibility, crucial for the manufacturing sec-

tor's future amidst global challenges like climate change. Despite women receiving higher performance ratings, they face a 14% lower likelihood of promotion due to bias in mentoring and sponsorship opportunities. Addressing these biases not only ensures equitable career progression but also taps into a substantial talent pool, crucial for filling AI-skilled management roles in the \$321.98 billion smart factories market projected by 2032.

Closing the AI skills gap and promoting inclusive leadership isn't just about fairness; it's about securing economic resilience and driving sustainable growth. By empowering women with AI skills and equal career opportunities, manufacturing firms can foster a more agile, innovative, and future-proof workforce that meets global challenges head-on.

Due to the scarcity of female leaders and managers in manufacturing, the limited responses collected from tests and previous studies indicate that four factors — Opportunity, Motivation, Encouragement, and Incentives — have a positive relationship with Technology Upskilling, which correlates strongly with promoting women to leadership roles. Some findings and past research indicate that men tend to upskill at a faster pace than women, leading to more consistent career progression for men in leadership roles within manufacturing industries. Moreover, demographics and social perceptions of women in workplaces, as highlighted by past research, significantly contribute to reluctance to upskill. This reluctance negatively impacts women's chances of promotion to leadership roles, whereas male counterparts in manufacturing often face fewer obstacles and thus have a competitive advantage.

Conclusion:

This paper underscores the critical need to address gender disparities in leadership roles within the manufacturing sector, exacerbated by significant gaps in technology skills and sponsorship opportunities for women. As industries navigate the transformative impact of AI and digitalization, fostering gender diversity in leadership is not only imperative for equitable representation but also for driving innovation and sustainability. The proposed strategies include enhancing AI hybrid skill development programs tailored for women considering the social factors, implementing robust mentorship and sponsorship initiatives along with counselling for career advancement & leadership, and cultivating inclusive workplace cultures that support career progression based on merit. These initiatives aim to bridge the gender gap in manufacturing leadership while promoting sustainable workforce development.

It's important to note that this conclusion is provisional and subject to modification based on forthcoming quantitative analysis following the

completion of our ongoing survey. This iterative approach ensures that our strategies remain informed by empirical data, enhancing their effectiveness in promoting gender equality and fostering inclusive leadership practices across manufacturing industries.

Summary:

The study addresses critical challenges women encounter in attaining leadership roles in manufacturing, highlighted by significant gender disparities in technology skills acquisition and leadership advancement opportunities. These disparities are underscored by global data showing women's limited representation in AI-related roles crucial for future manufacturing competitiveness. By understanding and mitigating these barriers through targeted strategies, the study aims to foster a more equitable and effective leadership landscape in manufacturing, aligning with sustainable workforce development goals.

This study employs a mixed-method approach, integrating Upper Echelons Theory and Intersectional Theory, to comprehensively examine the underrepresentation of women in leadership roles within manufacturing. Upper Echelons Theory provides insights into how leadership characteristics influence organizational outcomes, while Intersectional Theory explores how intersecting social identities shape women's experiences in manufacturing. Quantitative surveys across manufacturing organizations capture demographic data on leadership teams, AI skill levels, and the availability of mentorship and sponsorship programs. Qualitative methods, including interviews and focus groups with women in leadership and non-leadership roles, provide deeper insights into their unique challenges and perceptions. These combined approaches enable us to identify barriers and propose actionable strategies for enhancing inclusivity and promoting green innovation in manufacturing leadership.

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Core values

1. Passion:

The soul of Welingkar blossoms in our heart, mind and body.

2. Breakthrough Thinking:

We foster academic rigour in an environment conducive to innovation.

3. Result oriented, Process driven Work Ethic:

We adopt dynamic quality processes to ensure accountability and exceptional performances.

4. We Link and Care:

We support and collaborate with all our stakeholders through mutual trust and respect.



Quality policy

We are committed to give our students Quality Management Education in tune with the changing needs of business and industry.

We shall endeavor to do this by:

- Providing the best learning resources.
- Making the environment conducive for students to develop their creativity, Leadership skills and ability to learn continuously.

We shall follow a data oriented factual approach to Quality Management leading to continual improvement of our processes culminating in total customer satisfaction.



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