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Article- 1

ROLE OF SOCIAL MEDIA ON PUBLIC OPINION AND ENVIRONMENTAL MOVEMENTS

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Over the past decade, social media has been a powerful tool for molding public opinion and channeling environmental movements. In this context, the paper has focused on the multiple roles of social media, with a more reflective interest in Twitter, Facebook, and Instagram, within environmental activism and awareness.

Finally, the study looks at how social media influences environmental movements. First, there is this mobilizing role whereby social media plays as a catalyst for swift organization in terms of protests, campaigns, and events. Second, the amplification of voices takes place, in which voices normally marginalized by traditional media get a larger platform in mainstream media. Third, social media spreads information and educates the public about environmental issues and concerns, advocating for conscious practices in sustainability.

In addition to this, the research also analyzes how social media can and does often direct public opinion. Through the case studies of trending topics, posts, or powerful hashtags, it demonstrates how public discourse is framed by social media interactions on environmental issues. This digital environment, where ideas spread quickly, can be used to dispense both information and misinformation, which makes it a critical platform for critical media literacy.

The study concludes with a discussion of the recommendations for the effective application of social media for supporting environmental movements and creating an informed and engaged public. In summary, such research points to the need for strategic approaches that take advantage of the benefits of social media in shaping
environmental advocacy and public opinion, while also mitigating against the drawbacks.

Keywords- molding, mobilizing, amplification, sustainability and literacy.

Article - 2

Brand Perception and Customer Satisfaction towards Public and Private Sector E-Banking Services of Madhya Pradesh

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Abstract
Banks play a major role in all the economic and financial activities in modern society. A strong banking sector is a necessity for all economies to develop and expand. Banking in the present scenario demands continuous innovation in order to meet the aspirations of the demanding customers. E-banking is an innovation which allows customers to access banking services electronically such as to pay bills, funds transfer or to obtain any banking information and advice through the internet. It has been widely adopted by customers worldwide. The present paper attempts to examine the impact of perception of customer satisfaction towards e -banking services of Madhya Pradesh. The study also attempts to make a comparative analysis of customer satisfaction between private and public sector banks.

Keywords: E Banking Services, Customer Satisfaction, Perception

INTRODUCTION

E-banking is an umbrella term for the process by which customer may perform banking transactions electronically without visiting financial institution. Compared with traditional channels of offering banking services through physical branches, e-banking uses the Internet to deliver traditional banking services to their customers, such as of opening accounts, transferring funds, and electronic bill payment. E-banking services are delivered to customers through the Internet and the web using Hypertext Markup Language (HTML). In order to use e-banking services, customers need Internet access and web browser software. Multimedia information in HTML format from online banks can be displayed by the web browsers. The heart of the e-banking application is the computer system, which includes web servers, database management systems, and web application programs that can generate dynamic HTML pages. Bank customers' account and transaction information is stored in a database, a specialized software that can store and process large amounts of data at high speed. The function of the web server is to interact with online customers and deliver information to users through the Internet. e - banking enables the customers to perform the basic banking transaction by sitting at their offices or home through the internet. The customers can access the bank website for viewing their account details and perform the transactions on account as per their requirements. Customers are being provided with additional delivery channels like ATM Smartcards, home banking, mobile banking etc, which are more convenient to customers and are cost effective to the banks. Customer satisfaction has been considered the essence of success in today's highly competitive banking industry. Prabhakaran and Satya (2003)1 mentioned that the customer is the king. Customer satisfaction is an overall customer evaluation of a product or service based on purchase

and consumption experience over a time period. Satisfaction of customer is the most important factor in judging the services quality of banking sector. Thus an increase in satisfaction levels leads to decrease in operating and service costs and provides an opportunity for banks to expand their product portfolio and services for the future development. Banking is a service and service quality has been found to be an important criterion in achieving customer satisfaction. However, measuring service quality has always been a challenge for service providers because of the intangible, inseparable and heterogeneous nature of services. As such services are more akin to performances rather than objects. These distinctions enabled Parasuraman, Zeithmal & Berry (1988) to develop an instrument for measuring service qualitynamed SERVQUAL (an acronym derived from the term " Service Quality") . SERVQUAL measures perceptions of service quality across ten dimensions: tangibles, reliability, responsiveness, competence, courtesy, credibility, security, access, communications and understanding the customer.

Review of Literature

Service quality has been found by many researchers to be the antecedent of customer satisfaction (Bedi, 2010; Kumar et al., 2010; Kumar et al., 2009; Naeem and Saif, 2009; Balaji,2009; Parasuraman et al., 1988). Quality customer service and satisfaction are recognized asthe most important factors for bank customer acquisition and retention (Jamal, 2003;Armstrong and Seng, 2000; Lassar et al., 2000). Service quality is considered as one of theoretical success factors that influence the competitiveness of an organization. A bank can differentiate itself from competitors by providing high quality service. Service quality is one of the most attractive areas for researchers over the last decade in the retail banking sector(Stafford, 1996; Johnston and Jeffrey, 1996; Angur et al., 1999; Lassar et al., 2000; Gounaris etal., 2003; Choudhury, 2008).The important studies related to customer satisfaction in e banking services are briefly reviewed as below: Dr. Geeta Sharma & Mr. Surendra Malviya(2014)2 in their study "Internet Banking Service Quality and its Impact on Customer satisfaction in Indore district of Madhya Pradesh "mainly focused on internet banking service quality to maintain customer satisfaction. The work attempts to develop a model based on service quality dimensions with purpose to investigate impact of service quality factors and to analyse its impact on customer satisfaction. The main objective of this empirical study was to explore internet banking service quality dimensions like website ease of use, comfort and accessibility which are influential factors while confidence and responsiveness also have significant impact on satisfaction of the online customers. The empirical results show that there is a direct relationship between internet banking service quality dimensions and customer satisfaction in the banking industry, Manilall Dhurup Jhalukpreya Surujlal & Ephraim Redda (2014)3 in their paper "Customer perceptions of Online Banking Service Quality " provide an insight of customer perceptions of technology based banking service and quality in a developing country . The results show that periodic measurement of the levels of online banking service quality should become an integralpart of any bank's efforts and strategy in improving service quality levels. Justus Muthuri Marete, Henry Peter Gommans & Gongera Enock George (2014)4 in their study "Evaluation of E- Banking Services on Customer Satisfaction: Case of National Bank of Kenya" provide empirical evidence regarding satisfaction of customers with e- banking and provide recommendations. It also evaluated customer satisfaction with e-banking service at National Bank of Kenya. The main objective of the study was to investigate e- banking web design; exploration of e-banking customer service; assessment of e-banking assurance and examination of preferential treatment of e-banking effect on customer satisfaction in the banking industry. Itwas found that more customers were satisfied with most dimensions of e-banking service in NBK.

Objective

To compare Brand Perception of e banking on Customer Satisfaction with respect to public and private sector banks.

To analyze the objective and the consequent hypothesis, the study has been divided into three parts, these are as follows:

a) Perception towards elements of e-Banking

b) Perception towards e-banking Characteristics

Hypotheses Testing

The non-parametric test is applied in this study because the collected data was not normally distributed. There are various statistical tools available for hypothesis testing. However, the researcher has used Independent Samples Mann-Whitney U Test and One Sample Wilcoxon Signed Rank Test.

H01(null): There is no significant difference in perception of customers towards Public and Private Sector bank with respect to e-banking.

H02 (null): Customers have unfavourable perception towards characteristics of ebanking.

Research Methodology

Sample Selection

The researcher has found that Canara Bank, Bank Baroda, SBI and Bank of India from the Public Sector and ICICI Bank, HDFC Bank and Axis Bank from the Private Sector were highly automated and were providing all the e-banking services such as ATM, Credit Card, Mobile Banking and Internet Banking to their customers. These banks have maximum level of branch automation and providing most of the e-banking services in Indore City.

Sampling Technique:

For the purpose to draw a sample, the snowball sampling methods was followed to identify the respondents and only those customers were selected who were using all the e-banking service channels of our study (i.e., ATM, Internet banking, Mobile Banking, Credit card).

The researcher has selected samples from Employed (Govt./PSU), Businessman, Professionals and Retired persons.

The researcher has defined an approximate quota of samples in appropriate manner based on prior information collected through interviews of branch managers and selected various types of samples.

Sample Size: The researcher has taken 400 as the sample size.

A total of multiple-choice responses of 400 respondents were obtained from the branches of two banks i.e. 249 respondents from Public Sector, 151 from pvt sector.

Reliability Test: In the scale purification process the researcher has conducted Cronbach Alpha reliability test by using SPSS 22.0. Only those items were selected which have Cronbach's Alpha at least 0.70 or more.

The table 1 indicates that all the items under each dimension are reliable and valid for further analysis.

Table 1

Dimension	Cronbach Alpha	Number of Items
Dimension 1 (Accessibility)	0.85	14
Dimension 2 (Convenience)	0.91	7
Dimension 3 (Privacy)	0.75	8
Dimension 4 (Security)	0.70	7
Dimension 5 (Design)	0.73	6
Dimension 6 (Content)	0.72	7
Dimension 7 (Speed)	0.74	8
Dimension 8 (Fees & Charges)	0.84	10

Perception towards e-banking was assessed by recording the responses of respondents towards ***major components of e-banking i.e., ATMs, Internet Banking, Mobile Banking and Credit Cards.***
The table 2 reflects the recorded responses of respondent's perception towards the elements of e-Banking services of the Public Sector Bank. The data reveal that customers have excellent perception about the Credit Card of the Public Sector Bank. However, the customers of the Public Sector Bank have just a good perception about its ATM and Internet Banking Services. There are a few respondents who carry a bad perception about e-banking service elements of the Public Sector Bank.

Table 2: Descriptive Statistics Perception of e-Banking Services of Public Sector Bank (N = 249)

SN	Perception towards e-banking	Excellent	Good	Avg.	Bad	Worst
1	**ATM**	**14**	**105**	**85**	**28**	**17**
2	**Internet Banking**	**17**	**116**	**94**	**13**	**09**

3	**Mobile Banking**	**07**	**63**	**149**	**29**	**01**
4	**Credit card**	**180**	**56**	**13**	**00**	**00**

Table 3: Descriptive Statistics Perception of e-Banking Services of Private Sector Bank (N = 151)

SN	Perception towards e-banking	Excellent	Good	Avg.	Bad	Worst
1	**ATM**	**95**	**56**	**00**	**00**	**00**
2	**Internet Banking**	**50**	**96**	**05**	**00**	**00**
3	**Mobile Banking**	**30**	**98**	**22**	**01**	**00**
4	**Credit card**	**02**	**43**	**73**	**15**	**18**

The table 3 describes the perception of the respondents about the services of electronic banking in the Private Sector Banks. The results highlight the contrast in the status of customer's perception with reference towards the elements of e-banking services. It is found from the table that the customers of Private Sector Bank have an excellent perception about its ATM services. A good majority of the respondents highlights a good perception about the Mobile Banking and Internet Banking services of the Private Sector Bank. It is also realized from the recorded responses that the Credit Card service of the Private Sector Bank hold an average perception by the respondents.

Table 4: Descriptive Statistics for Perception towards elements of e-banking

Perception towards e-banking	Bank	N	Mean	Std. Deviation	Std. Error Mean
ATM	**Public**	**249**	**3.29**	**.977**	**.062**
	Private	**151**	**4.63**	**.485**	**.039**
Internet Banking	**Public**	**249**	**3.48**	**.843**	**.053**
	Private	**151**	**4.30**	**.527**	**.043**
Mobile Banking	**Public**	**249**	**3.18**	**.682**	**.043**
	Private	**151**	**4.04**	**.610**	**.050**
Credit Card	**Public**	**249**	**4.67**	**.571**	**.036**
	Private	**151**	**2.97**	**.959**	**.078**

The Table 4 displays the descriptive statistics towards e-banking of Public and Private sector banks. Comparing the mean of elements of e-Banking from both Public Sector Bank and the Private Sector Bank, *it is observed that the overall perception of the customers about the e-banking services is in favour of Private Sector Banks.*

Perception towards e-banking Characteristics

Descriptive statistics of customer satisfaction have been demonstrated in the below table. This can be seen from the table 5 that majority of the statements were rated more than the average value i.e., 3. A maximum value of (Mean = 4.56) was assigned to the attribute which asserted that in e-banking, customers don't wait.

Table 5

Characteristics of e-banking	N	Mean	Std. Deviation	Std. Error Mean
Consistent Performance	**400**	**2.98**	**1.480**	**.074**
Uninterrupted transactions	**400**	**2.50**	**1.280**	**.064**
Interpersonal interaction	**400**	**2.97**	**1.412**	**.071**
Customer feedback services	**400**	**3.49**	**1.461**	**.073**
Anytime anywhere access	**400**	**4.08**	**1.319**	**.066**
Saves time	**400**	**4.16**	**1.461**	**.073**
Ease to Use Transactions	**400**	**4.15**	**1.388**	**.069**
User friendly	**400**	**4.24**	**1.316**	**.066**
Access of account from abroad	**400**	**4.16**	**1.361**	**.068**
Convenient way to manage money	**400**	**3.99**	**1.365**	**.068**
Satisfactory security system	**400**	**4.00**	**1.110**	**.056**
Suitability of information to purpose	**400**	**3.86**	**1.231**	**.062**
Up-to-date information	**400**	**4.12**	**1.402**	**.070**
Appealing aesthetic content	**400**	**3.63**	**1.307**	**.065**
Speed of Transaction flow	**400**	**4.47**	**1.018**	**.051**
No waiting time	**400**	**4.56**	**.829**	**.041**
Speedy banking with lower cost	**400**	**3.71**	**1.144**	**.057**

Hypotheses Testing

H1a (null): There is no significant difference in perception of customers towards Public and Private Sector bank with respect to e-banking.

H1a (alt.): There is significant difference in perception of customers towards Public and Private Sector bank with respect to e-banking.

Perception towards e-banking was assessed by recording the responses of respondents towards the elements of e-banking i.e., ATM, Internet Banking, Mobile Banking and Credit Card. The collected data was subjected to the Independent Sample Mann Whitney U Test.

Table 6

Elements of e-banking	Test	Cal. Value	Table Value	Sig.	Decision
ATM	**Independent Sample Mann**	**+13.517**	**±1.96**	**0.000**	**Reject the null hypothesis**

Internet Banking	**Whitney U Test**	**+10.054**	**±1.96**	**0.000**	**Reject the null hypothesis**
Mobile Banking		**+11.101**	**±1.96**	**0.000**	**Reject the null hypothesis**
Credit Card		**+15.443**	**±1.96**	**0.000**	**Reject the null hypothesis**
The significance level is 0.05.					

From the above table 6, it is seen that the calculated value of all the elements of e-banking i.e. ATM (+13.51), Internet Banking (+10.05), Mobile Banking (+11.10) and Credit Card (+15.44) is greater than their respective table value i.e. ±1.96 This led to the acceptance of alternate hypothesis that is "There is a difference in perception of public and private sector banks' customers towards elements of e-banking."

b) Perception towards e-banking Characteristics

Literature also revealed the important attributes of e-banking. The present study aimed to understand the perception towards salient characteristics of customer perception. Respondents' response was recorded on various statements related to customers' perception towards e-banking. Reliability of data was checked with the help of Cronbach's Alpha whose value was found as .821 which was more than the cut off value of 0.7. The results of Cronbach's Alpha statistics established the internal reliability of the scale. Table 8 depicts the results of reliability statistics.

Cronbach's Alpha
.821 for 17 items

It was intended to see whether the results obtained via descriptive analysis held true for the population as well. Data violated the normality assumption as data under study was normal. So, non-parametric test namely 'One Sample Wilcoxon Signed Rank' Test was applied as test of significance at 0.05 (5%) level of significance.

The hypotheses for the test stated:

H1b (null): Customers have unfavourable perception towards characteristics of e-banking.

H1b (alt): Customers have favourable perception towards characteristics of e-banking.

This can be seen from the table 9 (next slide) that except consistent performance (0.899>0.05) and interpersonal interaction characteristics (0.324>0.05), customer perception was favourable for all other attributes of customer perception. This led to the acceptance (partial) of hypothesis "Customers have favourable perception towards characteristics of e-banking."

Table 7

Characteristics of e-banking	Sign.	Decision
Consistent Performance	0.899	Retain the null hypothesis
Uninterrupted transactions	0.000	Reject the null hypothesis

Interpersonal interaction	0.324	Retain the null hypothesis
customer feedback services	0.000	Reject the null hypothesis
anytime anywhere access	0.000	Reject the null hypothesis
Saves time	0.000	Reject the null hypothesis
Ease to Use Transactions	0.000	Reject the null hypothesis
User friendly	0.000	Reject the null hypothesis
Access of account from abroad	0.000	Reject the null hypothesis
Convenient way to manage money	0.000	Reject the null hypothesis
Satisfactory security system	0.000	Reject the null hypothesis
Suitability of information to purpose	0.000	Reject the null hypothesis
Up-to-date information	0.000	Reject the null hypothesis
Appealing aesthetic content	0.000	Reject the null hypothesis
Speed of Transaction flow	0.000	Reject the null hypothesis
No waiting time	0.000	Reject the null hypothesis
Speedy banking with lower cost	0.000	Reject the null hypothesis

Findings

- There existed a tremendous difference in perception in Service Quality of e-banking services provided by Public Sector Bank and Private Sector Bank.
- The perception of customers about the ATM as well as the Internet Banking of Private Sector Bank is better than that of Public Sector Bank.
- The Mobile Banking of Private Sector Bank has a better performance than that of Public Sector Bank whereas the Credit Card of Public Sector Bank has comparatively better performance than that of Private Sector Bank.
- The attributes like consistent performance, un-interrupted transaction and inter-personal interactions were having less favourable perception. However, attributes like Anytime Banking, Saving Time and Ease to use transactions, Access of account from anywhere and speed of transactions have very high perception.

Conclusion

- The PSU banks should be more responsible towards their ATM services. They should keep the ATM machine updated and trouble free.
- For Internet Banking, PSUs should design web pages attractive and interactive. The use of menus and the web pages and the language should be made easy to navigate and understand so that even non-educated customers could operate the e-banking services.
- The Public Sector Bank should keep customers information safe and strictly keep the customers financial and personal records away from the credit card agents, marketing agents etc.
- PSU banks should develop mobile banking applications which render flawless and easy service to all types of customers.

- The Credit Card service of PSUs needs to be further strengthened at the back end. The greater number of Point of Sales (POS) to be installed in order to expand the reach of e-banking services to a maximum number of customers.

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Article- 3

Influence of Digital Payment System on Petty Business of Street Vendors Using SEM

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Abstract

The term digital payment refers to a process of making some payment for certain sum of amount through mobile application or website round the clock across globe. Governments worldwide are actively promoting digital payment services due to their numerous benefits. The emergence of digital technology has significantly transformed conventional payment methods, increasing reliance on digital transactions. This paper aims to scrutinize the economic sustainability of digital tools and online procedures as adopted by the fixed food vendors of Indore City, which they consider as a medium of their incremental revenue. The paper has the application of descriptive research design with a quantitative approach. The primary data has been collected from 375 valid fixed food hawkers/vendors. Five Factors were identified using SPSS 2 and confirmatory factor analysis was done in AMOS Software, thereafter hypotheses were tested. The findings revealed a noteworthy increase in the revenue of food hawkers and vendors in Indore. These digital procedures are economically sustainable for these hawkers, as intense competition has also been increased due to the adoption of online food ordering applications and open the doors of digitization.

Keywords- Digital Payments, Street Vending**,** Growth

INTRODUCTION

The trend towards use of non-cash transactions and settlement in daily life began during the 1990s, when electronic banking became common. By the 2010s digital payment methods were widespread in many countries with examples including intermediaries such as *PayPal, digital wallet* systems such as Google *Pay*, contactless and payments by electronic card or cell phone, and electronic bills and banking, all in far and wide use.. Digital marketing is an umbrella term for the marketing of products or administrations utilizing advanced advances, essentially on the web, yet in addition including cell phones, show publicizing and some other computerized medium. There is a vast transformation from the conventional method of buying and selling (between persons) to Digitalized purchase and sale of goods.

Street Vendors

Street vendor means a person engaged in vending of articles, goods ,wares, food items or merchandise of daily use or offering services to the general public place or private area, from a temporary built up structure or by moving from place to place and includes hawker, peddler, squatter and all other . Fixed

food vendors and hawkers are the one of the most prominent element of food informal business in almost every part of India and they play a significant role. A habitual to this eating out concept. These food hawkers are fixed or mobile depending upon the volume of their business and reach of their consumers. Categorically, in food segment these vendors are mostly fixed at various publics places like major bus stands, railway stations prominent markets, cinema halls, educational institutions, shopping complexes etc. However, these fixed hawkers have no legal claim on the particular property.

Indore City of Madhya Pradesh where population is near about 33 lacs is one of the industrial, manufacturing and educational hub. There are many localities, shopping complexes and markets, cinema halls, plenty of educational institutions with state and private owned universities. People of Indore city are habitual of fixed food vendors and hawkers and these are the part and parcel of their lives. With the advent of digital means of conducting business, these hawkers have also started to adopt such online technologies so as to increase the scale (revenue/sales) of their business and eventually making these online modes economically sustainable amidst the stiff competition from organised online food retailers and online food ordering sites.

Here economic sustainability refers to the long term economic growth of their business without adversely impacting social, environmental and cultural aspects of the consumers. The problem arises that whether these hawkers after using the digital process are successful to beat the competition and make the best use of the same by increasing their revenue. Hence the purpose of this paper is to examine the impact of online mode of conducting business as a revenue generator for these hawkers.

REVIEW OF LITERATURE

Their have been several studies conducted related to the food hawkers and vendors - which are generally known as street vendors in different cities around the world. But for the current research, major recent contributions for the last four-five years have been identified and listed which are as follows:

Mathews, F., & Bhosale, A. (2021, September). As the country moves towards ***Cashless Environment*** after ***Demonetization*** so in a way or another it promotes the concept of digital India. But at the initial stage it gives a lot of confusion to the people whether it will give benefit and convenience or stress. Like everything Have two aspects for example, positive and negative, cashless transactions also have its positive effects as well as negative effects, some advantages and disadvantages as well. **Panda, S., & Sahoo, A. (2022)** Impact of Digital Payment on Business Performance: A Study of Street Vendors in Odisha. in his research paper examined that different factors that are influenced by the people for the purchase of goods through e – payment options. **Parikshit Chakraborty and Samarpita Koley (2018)** conducted their study at Jamshedpur and demonstrated that the male street vendors are in better condition as compared to the females as far as income in concerned. Furthermore they stated that the pattern of subsistence for daily street vendors is not comfortable for their livelihood. These street vendors are thus exposed to number of problems related to local administration, financial crisis and stability issues. As per study of **Vaishali Patil, Jayashree C. Gogte & Kishor Talnikar (2019)** their must be integration of food vending business with the main market in the concerned area of study Their study demonstrated that by rearranging the vendors from congested street to the main market , the possibility of systematic functioning of these vendors must have increased. They further recommended for addressing the issues of these food vendors on a priorty basis by the local administration. **Mubarack Kirumirah and Dr. E. J. Munishi (2021)** findings indicated that street vending involves people from diverse characteristics like gender, age, income, education, economic status, marital status and cultural status. They face different and varied challenges like lack of resources, lack of finances, lack of legal supremacy, lack of training etc. efforts must be taken to resolve their issues firmly from all endsMwallets integrate all the benefits of existing physical and digital payment methods for both firms and customers on a single platform which

leads to higher operational efficiencies and greater convenience (Cox and Sanchez 2012; UrbanAirship 2017). Only a few studies discuss the technical aspects (Tan et al. 2014) and customer adoption (Mal 2009), customer perception towards electronic payment.

This leads to a question: can Mwallets become a strategic marketing tool for retailers in emerging markets such that it increases the engagement of customers, and hence the economic values? Further, there is no study that explores how the effects of Mwallets change based on market, customer, and firm-related factors. We investigate these gaps in the literature.

This leads to a question: what are the factors that affect small vendors using digital payment system? And which factor influence more in the growth of their business?

Research Gap

Though the literature studied in this domain has not been very wide and intensive as almost all the researches conducted till date generally focussed on demographic profiles, challenges, problems, sustainability etc of these vendors and hawkers in general as research conducted in different parts of India. No specific emphasis laydown on a particular framework or to study (quantitatively) the impact of certain variables which are economically sustainable and directly influence the revenue of these hawkers. No study focussed on Growth of Business of small vendors

Objective

To identify growth in business of street vendors after adopting digital payment system.

Hypotheses Testing

H1= There is positive influence of ease of using digital Payment system on Growth of Business
H2=There is positive influence of security while accessing digital Payment system on Growth of Business
H3=There is positive influence of social acceptance in digital Payment system on Growth of Business
H4=There is positive influence of Usefulness in digital Payment system on Growth of Business

Research Methodology

This study targeted 373 respondents based on the convenience sampling technique

The survey was carried out using a self-administered questionnaire, which is divided into two major sections. Section A comprises demographic information. Section B contains 30 statements meant to measure the independent and dependent variables. The items were adapted from different studies, i.e. Ease to Use (UTAUT2, Davis (1989), Lee (2005)), Usefulness (Kim et al. (2010) and *Berry et al. 2002; de Kerviler et al. 2016),* security (Zeithaml, Parasuraman,and Malhotra (2002), Shang Gaoa,, John Krogstiea and Keng Siaub(2011), *Featherman and Pavlou 2003;Thakur and Srivastava 2014, Bauer [5], Pavlou [29], e–CAM of Park et al.),* social Acceptance (zhou et al. (2010)) and growth (Zhou et al. (2010) ,Wolfinbarger and Gilly (2003),Hooley et al. (2005).

The study adopts a five-point Likert scale, ranging from 1 for strongly disagree to 5 strongly agree with midpoint

The data was analysed using SPSS 26 and Structural Equation Modelling

Normality test : Skewness Less than 1 and Kurtosis less than 3, which was satisfied.

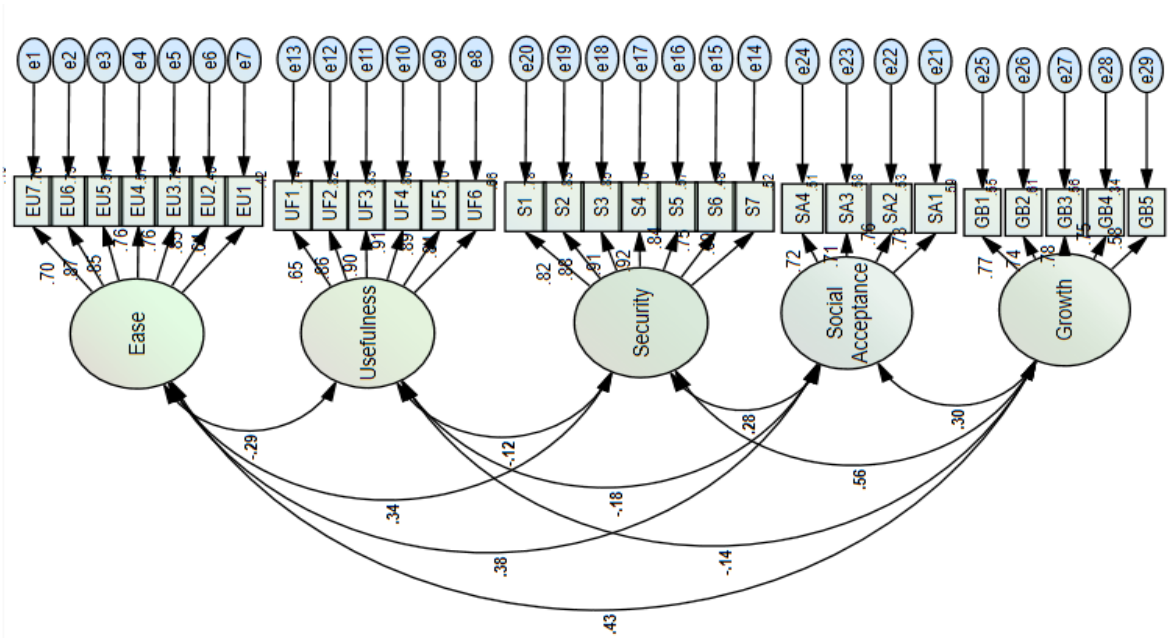
EFA

Barlett test of sphericity is highly significant (.000) and that the Kaiser-MeyerOlkin (KMO) measure of sampling adequacy for the independent variables .903. The data are therefore suitable for factor analysis. With eigenvalues 41.0 and 69.757 percent of total variance explained, five independent factors emerged from the analysis. All the items score factor loadings of 0.50 and above, and that items within the same factor are clustered together.

Validity and reliability analysis The questionnaire was piloted on 45 respondents prior to its dissemination in order to satisfy face validity. Minor modifications were made on the instrument as a result. In addition, the questionnaire's construct validity was also measured.

In addition, the average variance extracted (AVE) and composite reliability (CR) exceed the threshold of 0.50 and 0.70, respectively, which show adequate evidence of convergent validity of all the indicator items (Fornell and Larcker, 1981). The Cronbach's a scores for all the variables are higher than 0.60, implying that the constructs demonstrate reasonably high internal consistencies (Downing, 2004; Hair et al., 1998) We have investigated the common method variance by employing latent factor in AMOS which was found to be less than 30% . Therefore, common method variance was not a concern in this study.

CMB= is less than 30%

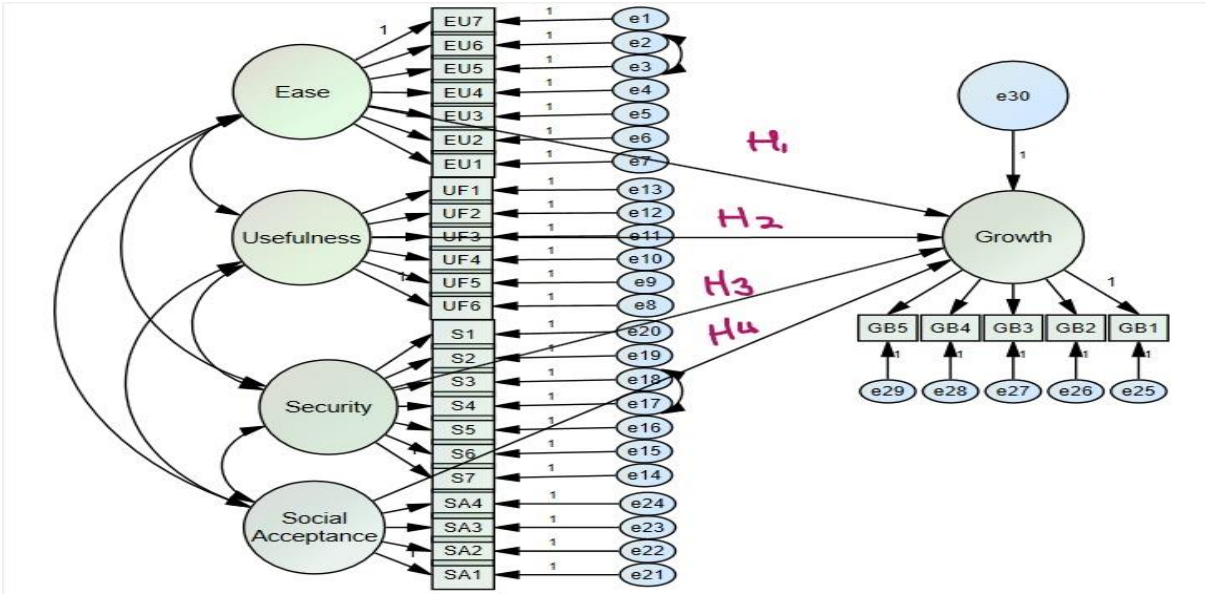


Hypotheses Testing

Validity analysis (Sem)

- In addition Composite reliability (CR) and the Average variance extracted (AVE) and exceed the threshold of 0.70 and 0.50, respectively

	CR (>.7)	AVE (>.5)	MSV	MaxR(H)	Social Acceptance	Ease	Usefulness	Security	Growth
Social Acceptance	0.819	0.531	0.162	0.820	0.729				
Ease	0.912	0.598	0.196	0.921	0.403	0.773			
Usefulness	0.938	0.718	0.081	0.950	-0.183	-0.284	0.847		
Security	0.940	0.693	0.329	0.947	0.297	0.345	-0.129	0.833	
Growth	0.849	0.531	0.329	0.858	0.302	0.443	-0.136	0.574	0.729


Ease
Usefulness
Security
Social Acceptance
EU7
EU6
EU5
EU4
EU3
EU2
EU1
UF1
UF2
UF3
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e14
e24
e23
e22
e21
H1
H2
H3
H4
e30
Growth
GB5
GB4
GB3
GB2
GB1
e29
e28
e27
e26
e25

Result & Discussion

CMIN= 1.984

GFI= .885 , NFI=.910 and AGFI= .863

IFI= .953 TLI= .948 RMSEA= .051

			B	Estimate	S.E.	C.R.	P	Hypotheses
Growth	<---	Ease	0.259	.204	.047	4.308	***	Supported
Growth	<---	Usefulness	0.009	.005	.027	.190	.849	Not Supported
Growth	<---	Security	0.468	.472	.061	7.710	***	Supported
Growth	<---	Social Acceptance	0.061	.042	.040	1.039	.299	Not Supported

Suggestions

Cleanliness and proper hygiene is highly essential for these food hawkers and vendors' being almost every social class is intended to eat from these hawkers.

Engaging the under aged children in the same profession must be prohibited.

Local administration of the city must have some concrete plan for the upliftment of these hawkers and vendors.

Conclusion

Vendors are aware of the use of the plastic money, UPI, E-wallet. More and more customers used cashless transactions easily embraced digital payments. However adoption of digital processes does not only mean online payment but it integrates several other factors. The study has also explained that the future growth of these food hawkers heavily depends upon how effectively they are able to manage the change resulting in the economic sustainability of their business. Thus, the study concluded that the street vendors are satisfied with the cashless payment offered by the street vendors. The result showed that easy and security had positively influence growth. This paper provides a framework that helps researchers and practitioners to understand the influence of digital payment system on accelerating the business of small vendors

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ARTICLE- 4

"Green Digital Innovation and Sustainable Business Models: A Study of Environmental Entrepreneurship in India"

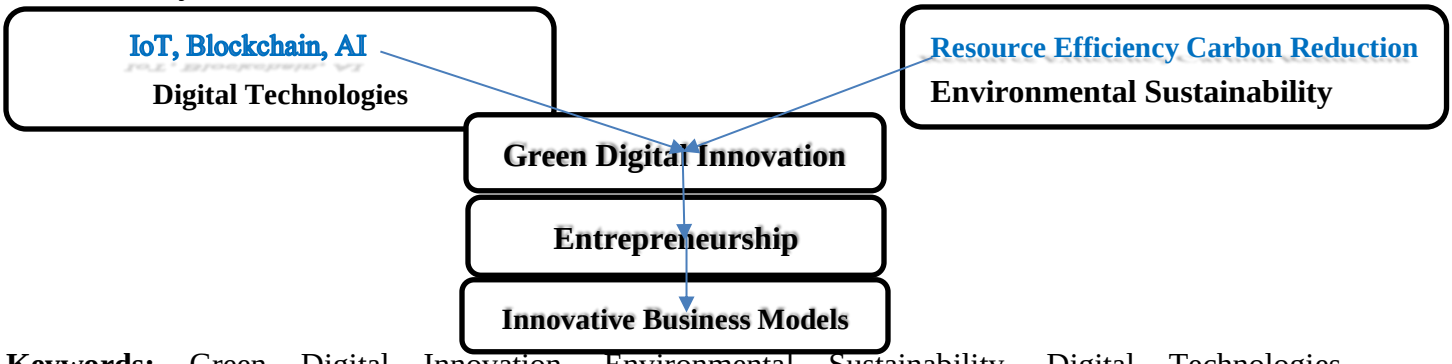
-Shweta Agrawal

The integration of digital innovation with environmental sustainability represents a transformative opportunity for economies, particularly in emerging markets like India. This paper investigates the synergy between green digital innovation and entrepreneurship, focusing on how cutting-edge digital technologies can catalyze sustainable business models and contribute to ecological preservation. Through a comprehensive analysis of case studies and empirical data, this research identifies pivotal trends, opportunities, and the obstacles that Indian entrepreneurs encounter in this evolving landscape.

Key areas of exploration include the application of Internet of Things (IoT), blockchain, and artificial intelligence (AI) in enhancing resource efficiency, minimizing carbon footprints, and fostering circular economy principles. The study scrutinizes innovative business models that utilize these technologies to develop scalable, impactful solutions for environmental sustainability. Moreover, it delves into policy implications, proposing frameworks to support the proliferation of green digital enterprises in India.

Findings reveal significant potential for aligning digital innovation with sustainability objectives, though challenges such as regulatory hurdles, limited awareness, and funding gaps remain prevalent. The research concludes with strategic recommendations for stakeholders, including policymakers, investors, and entrepreneurs, to create a supportive ecosystem that nurtures green digital innovation and entrepreneurship in India.

Diagram: Green Digital Innovation, Entrepreneurship, and Business Models for Environmental Sustainability in India.



Keywords: Green Digital Innovation, Environmental Sustainability, Digital Technologies, Entrepreneurship, Circular Economy, Resource Efficiency.

HR In-charge, Mangalayatan University, Jabalpur, M.P.

ARTICLE- 5

"GREEN DIGITAL INNOVATION AND ENVIRONMENTAL SUSTAINABILITY"

By-:

Chanchal Sahu
Namrata Shah
BALLB(HONS),1ST Year
Indore Institute of Law

The term "green digital innovation" refers to the fusion of cutting-edge digital technologies with environmentally conscious methods. In order to better understand how green digital innovation may transform companies, lower carbon footprints, and advance sustainable development, this research study looks at its many facets. The research commences by providing a definition of green digital innovation and enumerating crucial technologies, including big data analytics, blockchain, artificial intelligence (AI), and the Internet of Things (IoT). These technologies improve energy efficiency, allow for more effective resource management, and ease the shift to a circular economy.

The article explores case studies that highlight effective use of green digital solutions in a variety of industries, such as manufacturing, transportation, energy, and agriculture. For example, precision agriculture employs data analytics to reduce resource use and boost crop yields sustainably, while smart grids combining IoT and AI optimize energy consumption and integrate renewable energy sources. It also looks at how blockchain may guarantee accountability and transparency in supply chains, which lowers waste and pollution.

The study also discusses the difficulties and roadblocks that prevent green digital technologies from being widely adopted, including expensive upfront expenditures, complicated technology, and legal restrictions. In order to promote innovation and scalability, it highlights the necessity of enabling laws, public-private collaborations, and research and development spending. The study also examines the social ramifications, emphasizing how environmentally conscious digital technology can generate new employment opportunities and raise consumer and company understanding of environmental issues. Modern digital technology combined with environmentally friendly practices can help societies not only flourish economically but also improve socially and environmentally. The study emphasizes how important it is for governments, business partners, and the scientific community to work together in order to fully utilize green digital innovation for a future that is sustainable.

Keywords: Green Digital Innovation, Sustainable, Environmental, Digital Technology.

ARTICLE- 6

“ ..DIGITAL LEADERSHIP FOR SUSTAINABILITY..”

By :
Dhruv Narayan Singh
BALLB (HONS) 1 Year
Indore Institute of Law

Digitalization, as a new factor in production, can contribute to the innovation and sustainable development of organizations. The relationship between digital leadership and team performance is a key topic in the field of organizational studies. This research utilizes social exchange and affective event theories to create a model that examines the mediating mechanism and boundary conditions of the impact of digital leadership on team performance. Through the analysis of data from 130 teams in various regions and industries, the results indicate that:
(1) Digital leadership has a significant positive influence on team knowledge sharing.
(2) The effect of digital leadership on team performance is fully mediated by team knowledge sharing.
(3) The positive relationship between digital leadership and team knowledge sharing is regulated by the team’s emotional climate.
Digital leadership for sustainability entails leading organizations to utilize digital technologies in order to accomplish environmental, social, and economic sustainability objectives. This involves strategically employing digital tools, data analysis, and inventive solutions to enhance efficiency, decrease carbon emissions, and promote social fairness. Visionary digital leaders cultivate a culture of ongoing learning and adaptation, while also prioritizing ethical concerns and transparency. They have a crucial role in advancing sustainable development by aligning technological endeavors with wider sustainability goals, ultimately establishing resilient and forward-thinking organizations.

ARTICLE- 7

Digital Solutions for Air Quality Monitoring: Innovations by Indian Startups

Hemant Merawat[1]
Yash Choure[2]

Abstract

Air quality monitoring is the essence of a healthy environment as it impacts public health, environmental sustainability and overall quality of life. This research paper titled "Digital Solutions for Air Quality Monitoring: Innovations by Indian Startups," gets deeper into the magnitude of air quality monitoring and finds the role of digital solutions in this sphere. It provides an overview of the innovative efforts by Indian startups in developing technologies to counter air pollution. Air pollution in India is a serious concern as major sources subjected to Particulate Matter (PM10) pollution, as reported by the Central Pollution Control Board (CPCB). This paper marks off various air pollutants and their sources, seeing the gravity and complexity of the problem. The pernicious effects of air pollution on health, environment and the economy are mentioned in detail. Present scenario of air quality among various Indian cities is discussed, marking the regions most affected by pollution. To counter this crisis, the paper examines the preventive measures initiatives by the Indian government and their impacts. Major focus of the research is on the innovations done by Indian startups in the emerging field of air quality monitoring. These startups are depending on digital technologies such as Iot, AI, and big data analytics to produce advanced monitoring systems, providing real-time data and actionable solutions for effective pollution management. This paper goes through the challenges faced by these startups, including technological hurdles, Market constraints, and regulatory issues. It travels over future prospects and opportunities, emphasizing on emerging technologies, potential collaboration with government bodies and expecting opportunities for global expansion. In conclusion, this research brings out the critical role of digital solutions in air quality monitoring and the developing effort of Indian startups. It calls for continued innovation, supportive policies, and collaborative efforts to counter air pollution and enhance the quality and longevity of life in India and the world.

Key Words: *Technologies, Pollution, Startups, Artificial Intelligence*

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1. Introduction

As India has made its name into one of the fastest growing economies around the world. This transformation has led to a considerable amount of harm to nature in the name of air pollution. Due to industrial activities, vehicular emissions and agricultural practices air pollution in indian cities have seen significant spikes over the time. As per the report of the world air quality report 2023, India is regarded as the third most polluted country.[3] This raises major concerns as it affects millions of people's lives on a daily basis who are residing in the affected cities. If we see the current situation of air quality in cities like Delhi, Bikaner, Noida, Meerut and others in Northern India, AQI above 300 in 2023 is recorded.[4] For reference, An AQI between zero and 50 is considered 'good', 51 and 100 'satisfactory', 101 and 200 'moderate', 201 and 300 'poor', 301 and 400 'very poor', and 401 and 500 'severe'.

The government has taken a few initiatives such as the National Clean Air Programme, System of Air Quality and Weather Forecasting and Research (SAFAR) Portal, Graded Response Action Plan (for Delhi) and others. Despite of which India is still unable to counter Air Pollution. Major reasons which are holding India back are Rapid Vehicular Growth, Inadequate Infrastructure for Monitoring and Data Collection ,Inconsistent Implementation of policies which the government has made. Seeing the present circumstances India is in strict need of better frameworks to act upon. As we are living in the age of digitalization it is imperative to seek digital solutions in order to increase air quality. Thus the digital ecosystem of data is very important to comprehend the nuances between the hazardous and healthy air.

The startup culture in India is coming into play for promotion of green digital innovation. As there has been a lot of news ideas coming from prestigious institutions such as IITs, NITs regarding green energy and carbon neutrality. Governments must fund and promote the startups and organizations who are very strong advocates for carbon reduction, controlling air quality and safeguarding the environment. As India is a developing nation it is very obvious that it can not cut down on industrial activities as a lot of people's livelihood depends upon it. The same goes with vehicular emissions as traveling is also a very essential part of people's lives therefore it is an issue

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[3] HT Correspondent.(2024,March 19). India was 3rd most polluted country in 2023, Delhi most polluted capital. Hindustan Times. https://www.hindustantimes.com/india-news/india-was-3rd-most-polluted-country-in-2023- world-air-quality-report-101710836837575.html

[4] Metropolis India. (n.d.). Delhi's air quality: Understanding pollution causes and concerns. https://www.metropolisindia.com/blog/preventive-healthcare/delhis-air-quality-understanding-pollution-causes-and- concerns

to talk about. India's approach should be solutions based as major metropolitan cities in the nations are getting affected by it from which our country's economy runs. We must take preventive measures in order to provide a safe and secure life to our coming future generations.

2. Air Pollutants

Air pollutants are substances in the air that can have harmful effects on human health and the environment. They can be in the form of solid particles, liquid droplets, or gases.
Major pollutants present in air are basically categorized into following types:

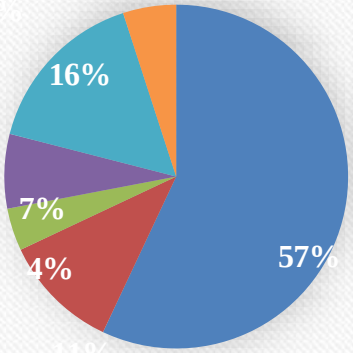
- **Carbon Compounds**: Oxides of carbon (Carbon dioxide (CO_2), carbon monoxide (CO) mostly released from all vehicles and burning of fossil fuels.
- **Sulphur Compounds**: SO_2, NO_2, HNO_3 released from power plants and all industry units.
- **Ozone**: (O_3) its level in air rises due to change in.
- **Chlorofluorocarbons**: Released in excess from industries, insecticides sprays etc.
- **Hydrocarbons**: Mostly benzene, benzphrene etc. released from vehicles.
- **Metallic Pollutants**: In excess lead, nickel, arsenic beryllium, tin, vanadium, titanium, vanadium etc. present in all three basic states as solid, liquid or in gaseous form.
- **Photochemical pollutants**: Photochemical smog, PAN.
- **Particulate matter**: Fly ash, grit, dust and Suspended Particulate Matter (SPM) released from hydroelectric power plants and industries. It also can include bacterial cells, fungal spores and pollen in air

3. Sources of Air Pollution in India

The challenges associated with air pollution in India, particularly in metropolitan areas where it is difficult to monitor and manage the pollution coming from a variety of sources. The most often identified sources of air pollution are automobiles, the manufacturing and electricity- generating industries, construction activities, road dust, burning waste and agricultural products, burning oil, coal, and biomass in homes, and marine/sea salt. Numerous studies have been carried out to evaluate the contribution of various sources in air pollution In 2017, the Central

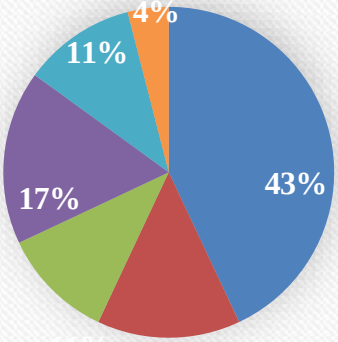
Pollution Control Board (CPCB) carried out a research to investigate the causes of urban air pollution. The findings indicated that air quality issues in cities are not just caused by vehicle transportation. Other sources also contribute to air pollution (Figure 1). Small towns and cities have seen an increase in air pollution in recent years. Policy makers and local managers are starting to have serious worries about the public's health. Excessive pollution in big cities and metropolitan regions has prompted the closure of companies and schools, and some residents have been advised to stay home. Several governments have attempted innovative steps to minimize air pollution. In Delhi, for example, odd-even days were instituted for automobile use, along with the erection of smog towers and other measures. Nonetheless, a thorough evaluation of these metrics' effectiveness is required. Effective action to reduce air pollution is required due to the ongoing deterioration of ambient air pollution in India's megacities and its spread to smaller towns, villages, and cities. Among the most significant obstacles to reducing air pollution are a lack of infrastructure, a lack of funding to implement cutting-edge infrastructure innovations, the difficulty of moving industries out of urban areas, and people's reluctance to adopt green solutions. An increase in air pollution causes health infrastructure costs to rise, labor productivity to decline, and agriculture productivity to rise. Tiny particles that enter the human body through the air cause illness and death. The quality of the local air is deteriorated when these minuscule particles, also known as particulate matter or PM, are spread throughout the atmosphere and transported by the wind, congregating in hotspots.

Pune



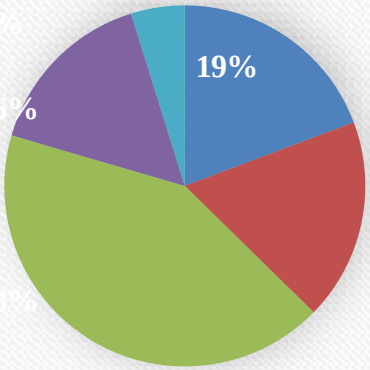
Road Dust
Domestic
DG Sets
Transport
Bricks Kilns
Waste Burning

Chennai



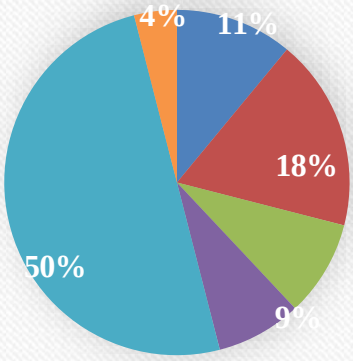
Transport
DG Sets
Domestic
Road Dust
Others
Bakeries

Mumbai



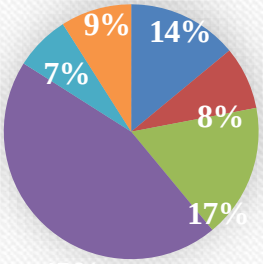
waste Burning
SIA
Dust
Industries
Marine
Transport

Bangalore



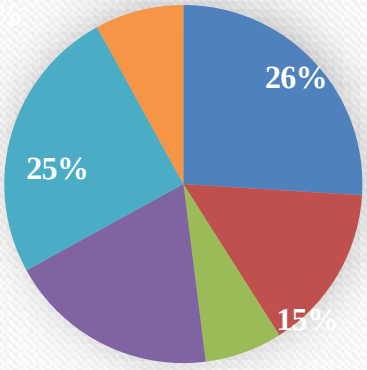
DG Sets
Transport
Industries
Secondary Road Dust
Domestic

Delhi



Transport
Industies
waste burning
Dust+ Construction
Domestic
DG sets

Kanpur



Industries
Transport
DG Sets
Domestic
Waste Burning
Road Dust

Table 1. Source Apportionment of Delhi to Air Pollution

Source	%Contribution in PM10
Construction	22-23.1
Road Dust	14.5-29.0
Waste Burning	10.5-24.4
Vehicles	8.7-20.5
Diesel Generator (DG) Sets	6.8-12.3
Industries	6.3-9.3
Domestic	2.7-9.4

Source: CPCB study 2017

3.1 Major Sources of Air Pollution

There are numerous sources for occurrence of air pollution; some of these sources can be widely classified into following types.

3.1.1 Vehicles – A Major Cause

The main cause of air pollution is the hazardous chemicals that are emitted by different types of vehicles. The transportation pattern has also changed as a result of this gradual transformation, since people now prefer driving on roads over taking trains. According to estimates, India will have 326.3 million automobiles overall by the end of 2024. The majority of these vehicles are two-wheelers. Every day, between 800 and 1000 tons of pollutants are emitted into the air in the nation's biggest cities, with automobile exhaust accounting for half of this total. According to estimates, by the end of 2035, fuel demand in India will have increased overall from what it was in 2024. By the end of 2030–31, India is predicted to have reduced its CO2 emissions by the equivalent of seven million four-wheeler removals, and saved 65 percent of its total energy consumption if 50 percent of its fuel efficiency is attained by policy revisions. In sum, India's transportation sector releases 15% of the country's CO2 into the atmosphere. It has been found that 6 percent increase in quantity of CO_2 emissions occurs per year [5].

[5] International Energy Agency. (2023,March). *CO2 emissions in 2022*. https://www.iea.org/reports/co2-emissions- in-2022

3.1.2 Industrial Wastes and Thermal Power Stations

As a result of the quick industrialization and the construction of several factories, many companies have been operating for a long time, emitting the main pollutants SO2 and NO2. It has been noted that the Taj Mahal and other monuments at Fatehpur Sikri are deteriorating as a result of oil refineries located in Mathura[6]. In addition to industries, there are a large number of thermal power plants that use millions of tonnes of coal. The main pollutants these facilities release include fly ash, hydrocarbons, sulfur dioxide, and other gases. Table 1 provides information on the different pollutants that are released by a 200 MW thermal power plant, which uses 1400 tonnes of coal daily in total.[7]

Pollutant	**Concentrations Per Day Consumption**
Carbon Dioxide (CO2):	0.9-0.95 kg/kWh
Nitrogen Oxides (NOx)	8.89-26.55 ug/m3
Sulfur Dioxide (SO2)	3.61-18.9 ug/m3
Particulate Matter (SPM)	52.6-193.2 ug/m3

Table 1: Data related to various pollutants released from a 200 MW thermal power plant

3.1.3 Other Anthropological Sources

In addition to the primary sources mentioned above, burning crop wastes by farmers and using stoves and incinerators are significant contributors to air pollution.

- Aerosol mists and refrigeration operations.
- Production of methane as a result of trash accumulation in landfills.
- Verification of nuclear weapons by army personnel's.
- Volcanic activity that is unpredictable and produces a lot of ash, fumes, and other harmful substances
- Unpredictable wildfires.

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[6] Dinesh Meena.(2015). MATHURA REFINERY CAUSING POLLUTION HAVOC TO THE TAJ MAHAL,
Indianl Journal of Commerce and Management Studies. AIJRA, *VOL 1(1)* chrome-extension://mhnlakgilnojmhinhkckjpncpbhabphi/pages/pdf/web/viewer.html?file=http%3A%2F%2Fwww.ijcms201 5.co%2Ffile%2Fvol-i-issue-1%2FAIJRA-VOL-I-ISSUE-1-41.pdf

[7] National Environmental Engineering Research Institute. (n.d.). *Conducted by National Environmental Engineering Research Institute*. Ministry of Statistics and Programme Implementation. https://mospi.gov.in/conducted-national- environmental-engineering-research-institute

- Animal decomposition that results in methane production.

4. Effects of Air Pollution

Air pollution is a serious environmental problem that negatively affects both the environment and human health. The consequences of air pollution are extensive and can be divided into three main areas: economic losses, environmental repercussions, and health issues.

4.1 Health Concerns

Numerous health issues, including as cancer, heart disease, and respiratory disorders are associated with air pollution. High pollutant concentration exposure is linked to the following main health concerns:

- **Respiratory Irritation and Dysfunction**: Particulate matter, sulfur dioxide, and nitrogen oxides are examples of pollutants that can induce respiratory irritation and malfunction, which can result in diseases like asthma and chronic bronchitis.
- **Cardiovascular Diseases**: Extended exposure to air pollution has been associated with a higher risk of cardiovascular disorders, such as arrhythmias, heart attacks, and strokes.
- **Cancer**: The International Agency for Research on Cancer has identified exposure to air pollutants as a human carcinogen, and there is evidence that this raises the risk of lung cancer as well as other cancers.
- **Neuropsychiatric Complications**: The neuropsychiatric consequences of air pollution, such as anxiety, depression, and cognitive decline, have been related.
- **Eye and Skin Irritation**: Pollution exposure can irritate the skin and eyes, which can result in disorders including dermatitis and conjunctivitis.

4.2 Environmental Impacts

Air pollution also has significant environmental impacts, including:

- **Thermal Pollution**: Thermal power plants release heated wastewater into water bodies, which can harm aquatic biota and alter the local ecosystem.
- **Ash Pond Decant**: The decantation of ash ponds can lead to fugitive dust and increased turbidity in water bodies, harming aquatic life.

- **Climate Change**: Air pollution contributes to climate change by releasing greenhouse gases, which intensify heat and lead to more extreme weather events.

4.3 Economic Losses

Air pollution also results in significant economic losses, including:

- **Healthcare Costs**
- **Lost Productivity**
- **Environmental Damage**

5. Preventative Measures Followed in India

After facing numerous challenges on air pollution India has implemented several measures and policies to keep a check in controlling the air pollution. Considering how severe the consequences of the air pollution can be, action is much needed. Government does realize the call for taking action therefore they have introduced initiatives which we will be discussing.

5.1 Major Policy Implemented by the government

1. National Clean Air Programme :

- National clean air programme (NCAP) has been introduced by the Ministry of Environment, Forest and climate change (MoEFCC) in January 2019 with the expectation to improve air quality in 131 cities (non-attainment cities and Million Plus Cities) in 24 states.
- Recently, the Centre has expected a new target of a 40% reduction in particulate matter concentration in cities covered under the NCAP by 2026.
- NCAP has estimated a reduction by 20-30% in PM_{10} and $PM_{2.5}$ concentration over baseline in 2017 by 2024.
- The NCAP was the first ever effort in the country to frame a national framework for air quality management with a time bound reduction target.

2. Measures for control of vehicular emissions:

- Making a jump from the BS-4 to BS-6 fuel standards from 1st April, 2018 in NCT of Delhi and from 1st April, 2020 for the rest of the country.
- The BS-5 fuel system is more efficient than the BS-4 in terms of vehicular emissions.
- RFID (radio-frequency identity) system implemented by South Delhi Municipal Corporation (SDMC) for the collection of toll and environment compensation charges from commercial vehicles entering Delhi.
- Initiative to set up compressed Bio-Gas (CBG) production plants and make CBG available in the market for use in automotive fuels.

3. Measures for control of industrial emission:

- Notifications have been issued for Thermal Power Plants regarding SO2 and NOx emission standards.
- There has been a Ban on use of pet coke and furnace oil as fuel in NCR States since October 24, 2017.
- Ban on use of imported pet coke in the country since July 26, 2018, with exception[8] [9].

5.2 Action taken by central pollution control Board (CPCB)

1. **Air Quality Monitoring and Network**

- National Air Quality Index (AQI) was launched in 2015. Information is being propagated to the public through daily air quality bulletins.
- Ambient Air Quality Network: The country has a network of around 1447 air quality monitoring stations covering 516 cities in 28 states and 7 UTs.
- AQI is monitored with other parameters and is published on the website in the form of AQI Bulletin after comprehension.

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[8] Ministry of Environment, Forest and Climate Change. (2023, December 7). *Strategies to control the rising pollution in the country*. Press Information Bureau. https://pib.gov.in/PressReleasePage.aspx?PRID=1983680

[9] Press Information Bureau. (n.d.). *Strategies to control the rising pollution in the country*. https://pib.gov.in/newsite/PrintRelease.aspx?relid=194865

2. Measures for control of vehicular refueling emissions

- Vapour Recovery System has been installed in new and old existing petrol pumps selling gasoline >100 kl per month plus cities.
- Directions issued to gasoline companies for installation of VRS

3. Measures for Control of Emissions from Stubble Burning

- CPCB has made guidelines for promoting setting up of paddy straw based pelletization and Torrefaction plants which might help supply chain issues.
- Monitoring of Active Fire Events has been done daily during the stubble burning period and reports are shared with the Commission on Air Quality Management in NCR.

5.3 Impact

Major impact has been seen after the directive measures given by the government. The main objective of the government implemented policies were to develop efficient and working ambient air quality monitoring networks across the country, To have efficient data and public mechanisms for timely measures for prevention of air pollution.
If we see things from an impact point of view then the National Clean Air Programme has been a help as we have seen that by 2024 of what target it has set to reduce particulate matter concentration in cities have been fulfilled of 20 to 30% reduction by 2024. The new target/goal is a 40% reduction in particulate matter concentration in cities covered under the NCAP by 2026.

6. Innovation by Indian Startups

As India is leading to a better economy more and more startups are coming in with their ideas to help and combat for the safety of the environment. As the situation of air quality is getting worse day by day in metropolitan cities it is now a necessity to find a solution to counter the hazardous particulate matter in the air. The startups have given their contribution whether it is little or huge to countering air pollution, we will be discussing about the startups who have received recognition for finding solutions to fight air pollution.

6.1 **Chakr Innovation**

It is an Indian startup who is primarily focused on building sustainable solutions to combat air pollution, mainly from diesel engines. Seeing its innovations and impact below we'll be discussing it below.

It was founded in 2016 by a group of students pursuing engineering for the Indian Institute of Technology (IIT) Delhi named Kushagra Srivastava, Arpit Dhupar, and Prateek Sachan.The mission of their startups was to give innovative and sustainable solutions to reduce air pollution, mainly focused on emissions from diesel generators. If we talk about their main innovations is the Chakr Shield, a device which can capture particulate matter emissions from diesel generators , stopping them getting released into the atmosphere.

The technology which is patented is used to cool the exhaust, causing the particulate matter to condense and be captured. The captured pollutants are then collected and processed. The particulate matter which is collected then is converted into ink and paints. This output is branded as “POINK” which stands for Particulate Matter Ink. This recycling turns back harmful pollutants into useful products.

By capturing up to 90% of particulate matter emissions from diesel generators, this startup is significantly improving air quality, majorly in urban areas where diesel generators are used in volume. Chakr Innovations has received several appreciations from its commendable work, including the Air Quality Champion and National Startups Award. Chakr Innovations has shown how engineering can address environmental challenges, transforming a major pollution source into a resource for creating products which are sustainable.[10]

6.2. Nanoclean Global

This is the startup known for providing affordable and effective solutions to counter air pollution at the individual person level. It started in Delhi where the most pollution is seen makes more sense for people there to work in an environment based startup.

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[10] Forbes India. (n.d.). *Chakr Innovation: Setting the wheels in motion to reduce emissions that contribute towards air pollution*. https://www.forbesindia.com/article/innovation/chakr-innovation-setting-the-wheels-in-motion-to- reduce-emissions-that-contribute-towards-air-pollution/87597/11

It was founded in 2017 by the alumni of the Indian Institute of Technology (IIT) Delhi which included Prateek Sharma, Tushar Vyas, and Vibhor Jain. Their aim was to five cost-effective to protect individuals from the hazardous effects of air pollution.

The key innovation of Nanoclean Global is the Nasofilter, a nasal filter developed to prevent harmful air pollutants from entering into the respiratory system. The Nasofilter is made using a special kind of technology which blocks particulate matter (PM2.5 and PM10) ensuring healthy breathing. The material used is very thin and light, making it easy to wear everyday.

Another product which they offer is Breathify which is a portable and concept air purifier which uses nanotechnology which gives clean air in small indoor spaces. This product is designed to use in cars, small rooms etc…

Nanoclean AC filters are also being developed by them which filters air conditioning units. Indoor air quality is enhanced by trapping dust and pollutants making sure cleaner air is passing in homes and offices. Nanoclean Global shows how new technology can be used to have simple yet very effective solutions to handle air pollution at individual level.[11]

6.3 Ambee

This is the startup which is providing real time environmental data, their primary focus is on air quality. We will be discussing their key interest and innovation which they have done.

Ambee was founded in 2017 by the team consisting of Madhusudan Anand, Jaideep Singh, and Akshay Joshi. Their objective was to create a healthy and safe environment by giving accurate, real-time data on air quality, enabling people, businesses and government to make sound decisions.

Their main innovation revolves around giving hyperlocal air quality by compiling data from on ground sensors, satellites, and other sources. This makes sure highly accurate information is going out. Their platform provides real time updates mainly on air quality, allowing their users to be updated with the latest pollution levels.

They offer API services which gives developers convenience to integrate real time data related to the environment into their application, websites etc.

By giving away accurate air quality data, Ambee helps people to protect themselves from harmful pollutants, reducing the risk of diseases related to cardiovascular and respiratory systems.

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[11] Economic Times. (n.d.). *Breath of fresh air: Nanoclean has a novel way to help city dwellers fight pollution*. https://economictimes.indiatimes.com/small-biz/entrepreneurship/breath-of-fresh-air-nanoclean-has-a-novel-way-to- help-city-dwellers-fight-pollution/articleshow/68404010.cms?from=mdr

Ambee stands out as it is providing environmental data analytics, providing information which is helping to handle adverse effects of air pollution and other challenges related to the environment.[12]

6.4 Ather

Ather Energy is an Indian startup who focuses on developing electric vehicles (EVs). We will be discussing how this Indian startup is doing as far as developing electric vehicles as concerned.
This startup was founded in 2013 by Tarun Mehta and Swapnil Jain. They are alumni of the Indian Institute of Technology (IIT) Madras. Their aim is to bring change in urban transportation by creating smart and eco-friendly electric vehicles for climate safety.
They have made electric scooters such as Ather 450X which is a flagship electric scooter for high performance and smart features. It offers quick acceleration, top speed of 80 km/h. The scooter can go up to 116 km in a single charge. They use a high scooter that uses a high capacity lithium ion battery which charges fast accordingly. They also have other variants such as Ather 450 Plus which is an affordable version of 450X with some compromises.
They have developed an excellent charging infrastructure known as Ather Grid, which has fast charging stations located in different parts of cities. They are accessible as their location is well planned. Their stations can charge scooters to 80% in about an hour making it easy for daily use. By promoting electric scooters, Ather Energy contributes in reducing air pollution and emissions of gas. Proving an alternative for traditional gasoline vehicles. Ather is expanding its presence across India by entering new cities with its scooters and charging infrastructure.
Ather Energy is using their technology for innovative designs to send a strong message that electric vehicles are the future and in order to provide our future generation a better environment to live in we must start using more eco-friendly vehicles such as electric vehicles compared to vehicles which rely on gasoline.[13]

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[12] MongoDB. (n.d.). *Ambee's AI Environmental Data Revolution Powered by Atlas*. https://www.mongodb.com/blog/post/ambees-ai-environmental-data-revolution-powered-atlas

7. Challenges and Future Directions

7.1 Technological Challenges

1. **Data Accuracy and Quality**: It is critical to guarantee the dependability and accuracy of data gathered by IoT sensors and other digital devices. The quality of air quality monitoring can be affected by problems like data integrity, environmental conditions that affect sensor performance, and sensor calibration.
2. **Integration and Interoperability**: It's still difficult to integrate different platforms, technologies, and gadgets. Ensuring smooth data transfer and interoperability among various systems is crucial for thorough monitoring of air quality..
3. **Scalability**: Significant technological hurdles arise when digital solutions are scaled out to cover greater areas and various surroundings. This entails setting up a sizable sensor network and handling the enormous data inflow.
4. **Data Security and Privacy**: Ensuring user privacy and safeguarding the gathered data against cyberattacks are critical. Strong cybersecurity measures must be put in place in order to uphold confidence and adhere to legal requirements.

7.2 Market and Regulatory Challenges

1. **Regulatory Compliance**: It might be difficult to navigate the complicated regulatory environment and guarantee local, national, and international regulations are followed. Compliance with regulations pertaining to data collection, storage, and sharing is crucial..
2. **Market Acceptance**: It can be challenging to persuade stakeholders—including corporations, governments, and the general public—of the benefits and dependability of digital air quality monitoring systems. It is imperative to exhibit the technology' effectiveness and affordability in order to gain market acceptance.
3. **Funding and Investment**: Research, development, and operations scaling all depend on securing sufficient capital and investment. It can be challenging for startups to draw in investors and stay financially stable.
4. **Infrastructure Development**: It takes a large financial commitment and careful logistical planning to set up the infrastructure required for the widespread deployment of air quality monitoring systems, particularly in rural or underdeveloped areas

7.3 Future Prospects and Opportunities

1. **Emerging Technologies**: Technological developments in blockchain, IoT, AI, machine learning, and 5G connectivity present enormous opportunities to improve air quality monitoring. With the help of these technologies, decision-making and preventative actions can be enhanced by more precise, real-time data and predictive analytics[14].
2. **Collaboration with Government and NGOs**: Solutions for monitoring air quality can be developed and put into action through public-private partnerships and NGOs. Funding, resource mobilization, policy formation, and community engagement can all be facilitated by these relationships.
3. **Global Expansion**: Indian startups have the chance to take their creative ideas to other markets with comparable air quality issues. Creating cross-border alliances and customizing technology to fit national requirements can increase global effect.
4. **Standardization and Certification**: Adhering to global guidelines and securing pertinent accreditations can augment the legitimacy and commercial viability of air quality monitoring systems. Putting in place strong quality assurance procedures helps promote adoption and foster confidence.

7.4 Global Expansion

1. **Market Diversification**

   - **Exploring International Markets**: Indian businesses might broaden their horizons by investigating foreign markets that face comparable issues with air quality. The creative solutions created by Indian companies can have a positive global influence and open up new commercial prospects for countries in Southeast Asia, Africa, and Latin America.
   - **Adapting Solutions for Global Needs**: Startups are able to customize their technology and solutions to satisfy the unique demands and legal specifications of several nations. This flexibility may make it easier for Indian inventions to be adopted internationally.

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[14] Scalac. (n.d.). *5G and IoT: Air Quality System Use Case*. https://scalac.io/blog/5g-and-iot-air-quality-system-use- case/

2. International Collaborations

- **Cross-Border Partnerships**: Technology businesses, research institutes, and foreign organizations can work together to help Indian startups become more capable. These collaborations can help with information sharing, gaining access to cutting-edge technologies, and working together to generate creative solutions.
- **Global Advocacy and Networking**: In the realm of air quality monitoring, Indian entrepreneurs can become more visible and establish themselves as leaders by taking part in international forums, conferences, and networks. Interacting with international stakeholders can stimulate advocacy campaigns and encourage the global adoption of best practices..

3. Standardization and Certification

- **Global Standards Compliance:** Solutions for monitoring air quality can become more credible and marketable by adhering to international certifications and standards. Startups that want to match their innovations with industry standards might work with international standardization agencies.
- **Tests and Quality Assurance:** The dependability and efficacy of Indian innovations can be demonstrated by establishing strong quality assurance and testing processes. Establishing trust can foster global expansion by fostering relationships with international customers and stakeholders.

8. Conclusion

The emergence of digital air quality monitoring technologies by Indian companies is a noteworthy development in tackling the urgent problem of air pollution. These firms are providing precise, real-time data on air quality by utilizing cutting-edge technology like IoT, AI, and big data analytics. Understanding pollution trends, locating sources, and developing practical mitigation plans all depend on this data. Even with the remarkable advancements, a number of obstacles still exist. Continuous innovation and development are required to overcome technological obstacles such regulating power usage, integrating varied data sources, and guaranteeing data veracity. Not to mention the necessity of supportive policies and defined

processes, market and regulatory problems also provide formidable barriers. Moreover, obtaining adequate capital and accomplishing broad market acceptance continue to be crucial problems for new businesses.

The future of air quality monitoring in India is bright. New avenues for improvement are presented by emerging technologies such as 5G connectivity, blockchain for data integrity, and sophisticated sensors. Working together with foreign partners, non-governmental organizations, and government agencies can hasten the adoption and efficiency of these technologies.

Furthermore, entering international markets might assist Indian businesses in making a bigger impact and ensuring their sustainability.

In Conclusion, the monitoring of air quality is being revolutionized in large part by Indian companies. They are paving the road for a cleaner, healthier environment and lessening the effects of air pollution with creative digital solutions. Sustaining and growing these efforts will require continual technology breakthroughs in addition to continued support from all stakeholders.

ARTICLE- 8

Shadows of Power: Analyzing the Impact of Hybrid Warfare in State-Sponsored Conflicts

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This study examines the evolving theory of hybrid warfare and its contemporary effectiveness, focusing on the global repercussions of state-sponsored hybrid warfare. Hybrid warfare, which combines conventional and unconventional tactics, often leverages informal, non-state actors to reduce the risk of diplomatic isolation for the states behind the conflicts. However, its

consequences are significant and far-reaching, impacting global actors. This research analyzes the hybrid warfare strategies of three major global powers- Russia, Iran, and China- in regions such as Ukraine, the Middle East, and the South China Sea, respectively. Drawing on multiple case studies, the paper explores the motives behind these hybrid strategies and the extent to which they influence global stability. By expanding the scope of hybrid warfare beyond Ukraine, this research aims to contribute to the literature on irregular warfare, offering a broader understanding of its impact on international security.This research utilizes a qualitative approach based on secondary data analysis. It draws from a variety of sources, including government reports, academic literature, news articles, and case studies, to evaluate the application of hybrid warfare by state actors. The study examines the political, military, and socio-economic dimensions of hybrid warfare to assess its strategic motives and global impact.

ARTICLE- 9

Environmental Justice: Ensuring Equity and Inclusion in Environmental Decision-Making

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Environmental justice is a critical movement that advocates for the fair treatment and meaningful involvement of all individuals, regardless of race, income, or nationality, in environmental decision-making. It seeks to address the disproportionate environmental burdens placed on marginalized communities, ensuring equitable access to a healthy and sustainable environment. This research explores the core principles of environmental justice, including equitable treatment, which ensures that no community, particularly marginalized groups, bears a disproportionate share of environmental harm; meaningful involvement, which calls for the active participation of diverse stakeholders in decision-making processes; and access to resources, emphasizing equal access to clean air, water, land, and the benefits of environmental policies and programs.

The paper examines how these principles are applied in policy frameworks and discusses the challenges and opportunities for advancing environmental justice globally. By analyzing case studies and global initiatives, the research aims to highlight strategies for incorporating environmental justice into broader environmental policies and to advocate for greater inclusion and equity in environmental governance.

A CRITICAL ANALYSIS OF WTO COMPATITABILITY OF INDIA'S NEW FARM LAWS

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A large percentage of India's population depends on the agricultural sector for their livelihood, making it a long-standing pillar of the country's economy. The government introduced farm laws such as market-driven mechanisms, easing trade restrictions, and fostering private sector participation. The farm law sought to reduce government involvement in agriculture, particularly in the Minimum Support Price System (MSP). This paper critically analyzes the impact of WTO agreements on Indian farmers. It also provides insights into how these reforms may reshape India's position in global agricultural trade. Furthermore, our research analyzes the development of Indian farmers and the agriculture sector's contribution towards the WTO's obligation. Additionally, this paper highlights the need for a balanced approach that protects the farmer's interest while following WTO rules. Research adds to the discussion on sustainable agriculture policies in India that transform India's role in global agricultural trade.

KEYWORDS: Farm laws , Market-driven Mechanism, Sustainable policy, Indian farmers, Global agricultural Trade.

ARTICLE- 11

Contents

Abstract 2

Introduction 3

Research Methodology 4

LITERATURE REVIEW 5

Green Digital Innovation 6

Benefits of Sustainable and Socially Responsible Business Models 7

Challenges and Criticism 8

Best Practices and Examples 10

1. Resource Efficiency: 10

a. Energy Efficiency Programs 10

b. Water Conservation 10

2. Recycling Initiatives 10

a. Waste Management and Recycling 10

b. Plastic Recycling 10

3. Reusing Materials: 10

a. Product Refurbishment 10

4. Closed-Loop Systems 11

a. Circular Supply Chain 11

b. Industrial Symbiosis 11

5. Sustainable Product Design 11

a. Eco-Friendly Products 11

b. Modular Design 11

6. Collaborative Consumption 11

a. Sharing Economy 11

b. Rental Services 11

Sustainability Trends in India 12

Government Regulations and Incentives 13

CSR Law 13

Sustainability Reporting Mandates 13

Subsidies and Incentives 13

Conclusion..... 14

Sustainable Business: Green Innovations and Entrepreneurship in India

ABSTRACT

In today's world, sustainability and social responsibility have become crucial for businesses of all sizes. Economic development should not come at the expense of ecological degradation. Green finance is a practical approach to achieving both economic and ecological progress. Consumers, employees, investors, and the public now expect companies to focus not just on profits but also on their impact on society and the environment. There is a growing recognition that business success should be measured not only by financial returns but also by contributions to addressing social and environmental challenges.

Sustainable and socially responsible business practices are no longer optional; they are essential for companies to maintain their social license to operate. By integrating sustainability into their business models and core operations, companies can future-proof themselves against climate change, resource scarcity, and evolving societal expectations. This makes it imperative for startups and businesses today to build sustainability and social responsibility into their DNA from day one.

Key words – sustainability, social responsibility, Businesses of all sizes, Economic development, Ecological degradation, green finance.

INTRODUCTION

The idea of developing sustainably now a days has become a responsibilityand is increasingly essential for all the sizes of businesses. Every person related to the business expects that business to not only focus on making profits but also maintain the idea of sustainable development for the betterment of the society as well as the environment, now the consumer, society and investors expects the company to not only be recognised by its financial stability or performance related to profit but also how much they contribute towards environment and social challenges. The idea of sustainable business practice is not an option but a prerequisite for the companies to maintain their company's social standards.

Idea of sustainable development is significant in environmental law which aims to balance economic growth and conserve the environment. To tackle the challenges of environmental degradation many summits and conferences took place to adopt the framework of sustainable development, the recent agenda for sustainable development is the 2030 Sustainable Development Goal (SDG's), The SDGs are the set of 17 goals and 169 targets and applies to all countries and goals strive to balance three sustainable objects of Economic, Social and Environmental Sustainability[1]. The sustainability has become an important aspect of every economic sector. Light up the idea of sustainable development the financial sector undoubtedly contributes towards sustainable development, they help the environment as the term "green finance," the concept of green finance has become popular worldwide, in this concept, government and private sectors invests in the projects which are promoting sustainable development.

Climate change, Deforestation, Carbon emission and Environmental pollution are just few endeavours. However the developed countries tend to support the sustainable activities, the developing countries confront the challenges relating to environment by the help of green finance, in year 2009 many countries promised to provide millions of dollars in UN summit by 2020, however the objective has not been met[2]. Asian Nations are expecting three trillion dollars by 2030 in the form of green finance[3].

Therefore, Sustainable, and socially responsible business practices are crucial for upholding a company's social license to operate. Integrating sustainability into core operations assists companies in navigating climate change, resource scarcity, and evolving societal

[1] United Nations Sustainable Development Goals (last visited June 10, 2024).
[2] UN News (last visited June 11, 2024).
[3] https://www.adb.org (last visited June 15, 2024)

expectations. Companies that overlook these obligations face the risk of losing customers, talent, regulatory approval, and investment capital.

RESEARCH METHODOLOGY

For the purpose of study and analysis the authors used secondary data. Secondary data is collected from various previously published research papers, internet blogs, google scholar, reports of commission, articles, and observation. The present research paper is mainly confined to secondary data as primary research in such a topic is very technical.

Content analysis is a methodology in social science by which texts are studied as to authorship, authenticity, or meaning. Content analysis is a summarizing, quantitative analysis of message that relies on the scientific methods and is not limited as to the types of variables that may be measured or the context in which the messages are presented or created.

LITERATURE REVIEW

Drivers of Green Digital Innovation (2017) : Researchers have identified several drivers motivating organizations to adopt Green Digital Innovation. These include regulatory requirements, cost savings through resource optimization, and the need to meet consumer demand for eco-friendly products and services

Challenges and Barriers (2019) : Despite its potential benefits, Green Digital Innovation faces several challenges. These include high initial costs, lack of expertise, and interoperability issues between different technologies. Overcoming these challenges is crucial for successful implementation.

Future Directions (2020) : The future of Green Digital Innovation lies in leveraging emerging technologies and fostering collaboration between stakeholders. Continued research and innovation are essential for driving sustainable development and addressing environmental challenges.

Green Digital Innovation-

green digital innovation is the fusion of technology and sustainability aimed at solving environmental problems and fostering a greener future. It involves implementing smarter, more efficient processes that conserve resources, reduce waste, and mitigate the negative effects of human activity on the planet. This approach not only helps protect the environment but also supports sustainable economic growth and improves the quality of life for current and future generations.

The primary aim of green digital innovation is to make processes, products, and services more efficient and less harmful to the environment. This involves rethinking traditional business models and adopting practices that minimize waste, reduce carbon footprints, and enhance the efficient use of resources. It encompasses a wide range of activities, from improving energy efficiency in buildings and manufacturing to developing new, sustainable products and services.

In essence, green digital innovation is about creating smarter, more sustainable ways of doing things. It encourages businesses to adopt practices that not only benefit the environment but also drive economic growth. By focusing on sustainability, companies can reduce costs, improve their brand image, and comply with increasingly stringent environmental regulations.

Moreover, green digital innovation is not limited to any one sector. It spans across various industries, including agriculture, manufacturing, energy, transportation, and waste management. The common thread is the use of innovative, technology-driven solutions to create a positive environmental impact.

green digital innovation is the fusion of technology and sustainability aimed at solving environmental problems and fostering a greener future. This approach not only helps protect the environment but also supports sustainable economic growth and improves the quality of life for current and future generations.

Benefits of Sustainable and Socially Responsible Business Models – Incorporating sustainability and social responsibility into business models has various advantages for both companies and society. Here are some key benefits:

1. Enhanced Brand Reputation
   - Embracing sustainability enhances brand loyalty and public perception, attracting consumers who prioritize environmental and social values.
2. Increased Customer Loyalty
   - Consumers increasingly gravitate towards brands that prioritize social and environmental responsibility, leading to heightened customer loyalty and trust.
3. Attraction and Retention of Talent
   - Companies that align with the values of their employees, particularly millennials and Gen Z, are more successful in attracting and retaining talent.
4. Regulatory Compliance and Risk Management
   - Proactively adopting sustainable practices helps companies comply with regulations, minimizing legal risks and potential penalties[4].
5. Cost Savings and Efficiency
   - Implementing measures such as energy conservation, waste reduction, and resource optimization results in substantial cost savings and enhanced operational efficiency.
6. Innovation and Market Differentiation
   - Sustainability initiatives drive innovation, fostering the development of new products, services, and business models that set a company apart in the market.
7. Capital Accessibility
   - Investors are increasingly considering environmental, social, and governance (ESG) criteria when making decisions, creating financing prospects for companies with strong sustainability credentials[5].

[4] K. Meidinger, Sustainable Practices and Legal Compliance in Business, Journal of Business Ethics(June 15, 2024), https://link.springer.com
[5] Ravi S. Sharma, The Role of ESG Criteria in Investment Decisions in India, Economic Times India(June 15, 2024),https://economictimes.indiatimes.com

8. Sustained Profitability in the Long Term

- Sustainable businesses are better positioned to navigate persistent challenges and uncertainties, resulting in more consistent and resilient financial performance.

9. Fostering Positive Social Impact

- By tackling social and environmental issues, companies actively contribute to the welfare of communities and the planet, promoting goodwill and societal backing.

10. Enhanced Competitive Position

- Companies that embed sustainability within their core operations can achieve a competitive advantage by satisfying the mounting demand for sustainable business practices.

Challenges and Criticisms–

Transitioning to sustainable practices entails substantial initial investments in modern technologies, infrastructure, and training, posing a significant burden for small to medium- sized enterprises (SMEs)[6]. Integrating sustainability into core operations is complex and time-consuming, often requiring an overhaul of existing processes, supply chains, and business practices. Finding a balance between the long-term benefits of sustainability and short-term profitability needs can be challenging, particularly for publicly traded companies pressured to meet quarterly financial results. Successfully navigating evolving environmental and social regulations demands significant resources and expertise from companies. Moreover, some consumers remain sceptical about businesses' sustainability claims due to instances of greenwashing where companies falsely portray themselves as environmentally conscious.

Measuring the impact of sustainability initiatives can turn out to be quite complex. It requires standardized metrics and reliable reporting methods. This is essential to ensure transparency and highlight tangible benefits to stakeholders. Making sure every part of a supply sticks to sustainable practices is no easy feat. Companies must work closely with suppliers and

[6] S. Gupta, Sustainability Challenges for Small and Medium Enterprises, SME J 5, 27, 27-30 (2019)

partners to match their practices with sustainability goals. It is a time-consuming process that needs significant negotiation and oversight.

Integrating sustainability into a company's culture demands considerable organizational change. This transition may face resistance from employees used to traditional work methods.

Critics claim that sustainable products and services often come at a higher cost. This might discourage price-sensitive customers and affect market competitiveness. Some question the true impact of sustainability initiatives, suggesting they could be more symbolic than substantial without strict enforcement and genuine dedication.

The risk of greenwashing erodes consumer trust, making it hard to differentiate truly responsible companies from those using marketing strategies. Stringent sustainability requirements could disadvantage businesses, especially in low-margin industries, potentially leading to job losses and economic downturns.

Certain companies see sustainability-related regulations as overly burdensome and costly to comply with. This could hinder innovation and economic growth, particularly for smaller businesses. Critics also point out the potential for unintended consequences, such as biofuel production causing deforestation and food price hikes.

Despite the significant benefits of embracing sustainable business models, it is vital to address these challenges and criticisms. Companies must navigate these complexities with strategic planning, unwavering commitment, and transparent communication. This approach will help them seamlessly integrate sustainability into operations and achieve lasting success.

Best Practices and Examples –

1. Resource Efficiency:

a. Energy Efficiency Programs-

Tata Steel: Tata Steel has implemented various energy-efficient technologies, including waste heat recovery systems and energy-efficient machinery, to reduce energy consumption and greenhouse gas emissions[7].

b. Water Conservation-

Arvind Limited: Arvind Limited, a leading textile manufacturer, has invested in water recycling systems and efficient dyeing technologies to significantly reduce water usage in their operations[8].

2. Recycling Initiatives:

a. Waste Management and Recycling-

Attero Recycling: Attero Recycling is a prominent e-waste recycling company in India. They recover valuable materials from electronic waste and have established a network for collecting e-waste from consumers and businesses[9].

b. Plastic Recycling

Hindustan Unilever: Hindustan Unilever has initiated programs to collect and recycle plastic packaging. They have committed to making all their plastic packaging reusable, recyclable, or compostable by 2025[10].

3. Reusing Materials:

a. Product Refurbishment-

Cashify: Cashify provides trade-in services for old smartphones and laptops, refurbishes them, and resells them. This business model helps in reducing electronic waste and making technology more affordable.

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[7] Tata Steel, https://www.tatasteel.com (last visited June 12, 2024).
[8] Arvind Limited, https://sustainablebrands.com (last visited June 11, 2024).
[9] Attero Recycling, https://sustainablebrands.com (last visited June 12, 2024).
[10] Hindustan Unilever, https://www.unilever.com (last visited June 12, 2024).

4. Closed-Loop Systems-

a. Circular Supply Chain

PepsiCo India: PepsiCo India has been working towards developing a circular supply chain. They are experimenting with using agricultural waste for biodegradable packaging materials and promoting sustainable agricultural practices.

b. Industrial Symbiosis-

Nandigama Integrated Industrial Park: This industrial park promotes industrial symbiosis where waste or by-products from one company are used by another. This initiative helps in optimizing resource use and reducing overall waste.

5. Sustainable Product Design-

a. Eco-Friendly Products-

Godrej Appliances: Godrej Appliances has introduced refrigerators with hydrocarbon refrigerants that are more environmentally friendly. They also focus on designing energy- efficient home appliances.

b. Modular Design-

Pepperfry: Pepperfry offers modular furniture that can be easily disassembled and reassembled, promoting durability and reducing waste by extending the product's life cycle.

6. Collaborative Consumption-

a. Sharing Economy

Zoomcar: Zoomcar offers car-sharing services across multiple cities in India. This service reduces the need for individual car ownership and promotes efficient use of vehicles.

b. Rental Services-

Flyrobe: Flyrobe provides rental services for high-end fashion items, encouraging the reuse of clothing and reducing the environmental impact associated with fast fashion.

Sustainability Trends in India–

India has observed a noticeable shift towards sustainability and social impact in business over recent years. Here are some key trends to take note of:

Firstly, Renewable Energy. India stands out as a prominent player in the global renewable energy market, setting ambitious targets to achieve a capacity of 450GW in renewable energy by 2030[11]. Solar energy has experienced remarkable growth, propelling India to the third position globally in terms of installed solar capacity. Various startups are making strides in the solar sector by introducing innovative products and financing models to enhance the accessibility of clean energy.

Secondly, Social Entrepreneurship. Indian startups are progressively embracing social impact models and incorporating social responsibility into their business operations. A wave of new companies is surfacing across sectors such as healthcare, education, financial inclusion, and women's empowerment. There is a surge in interest towards social entrepreneurship among young individuals and entrepreneurs striving to tackle India's development challenges through entrepreneurial endeavors.

Next up, Impact Investing. Impact investing, which seeks both financial returns and positive social or environmental impact, is gaining traction in India. Prominent impact investors like the Aavishkaar Group are nurturing socially oriented startups nationwide. Startup accelerators such as Unltd India and Villgro offer funding and assistance to early-stage social enterprises. Furthermore, the government has put in place mechanisms like SIDBI's fund-of- funds for startups to encourage impact investing activities.

sustainability is increasingly interwoven with innovation within Indian startups. Backed by supportive government policies and heightened awareness, entrepreneurs in India are harnessing the power of business to generate economic prosperity while creating significant social value simultaneously.

[11] R. Singh, India's Ambitious Renewable Energy Targets: A Global Perspective, REJ 12, 45, 45-50 (2020)

Government Regulations and Incentives –

The Indian government has implemented multiple regulations and incentives to encourage sustainability and social responsibility businesses. Important initiatives comprise:

CSR Law –

Enacted under the Companies Act 2013, the corporate social responsibility (CSR) spending compulsory for large corporations. Entities with a net worth exceeding Rs 500 crore, turnover surpassing Rs 1000 crore, or net profit greater than Rs 5 crore are required to allocate 2% of their average net profit from the previous year's towards CSR activities. This legislation established India as the pioneer in enacting CSR laws, resulting in significant funding being channelled into social causes such as education, healthcare, and environmental conservation[12].

Sustainability Reporting Mandates –

The Securities and Exchange Board of India (SEBI) mandated that the top one thousand listed companies based on market capitalization must include a Business Responsibility Report (BRR) in their annual reports commencing from FY 2012-13. The BRR necessitates detailed disclosures on environmental, social, and governance (ESG) parameters. This reporting framework was further fortified in 2015 to boost transparency and accountability[13].

Subsidies and Incentives

Various government schemes like the Modified Special Incentive Package Scheme (M- SIPS)[14]offer subsidies to industrial units in underdeveloped regions that prioritize energy efficiency and waste management. Tax concessions are provided for utilizing renewable energy sources, while accelerated depreciation is permitted on assets such as solar panels and

[12] Companies Act, § 135, No. 18, Acts of Parliament, 2013 (India)
[13]SEBI Listing Regulations, No. 5, Acts of Parliament, 2012-13 (India)

[14]Government Schemes for Industrial Units, No. 7, Acts of Parliament, 2016 (India)

wind turbines. Startups focusing on sustainability also have access to a range of grants, funds, and incentives from government initiatives, fostering innovation and advancement in the green sector.

Conclusion –

Businesses, no matter their size, now value sustainability and social responsibility a lot. By weaving sustainability and ethics into how they work, companies can save money, work better, boost their image, and attract top talent. Yet, going green also brings its share of hurdles. Companies need to figure out ways to make eco-friendly practices make financial sense and avoid focusing only on the short term. Things like committed leaders, involving stakeholders, tracking progress, and changing the company culture all play a key role.

In India's startup world, we see cool examples of companies that care about society while also being innovative in how they do business. If the government steps up with more rules, rewards, and partnerships between public and private companies, we can speed up this process.

In the end, businesses that genuinely care about lasting success are those that see sustainability as necessary from the start – not just an add-on. Yes, shifting to greener business practices takes time but forward-thinking companies need to take this path to create a better world for everyone.