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Editorial Note

GBAMS -Vidushi is a biannual peer reviewed research journal that focuses on the development of research oriented writing of papers having relevance in the global context. The journal is in accordant to the expectations of scholars and professionals across all the fields of management who are interested in conducting and learning from the research and contribute to management practices.

We ensure that accepted manuscripts must make strong empirical and/or theoretical contributions and highlight the significance of those contributions to the management and all the allied fields.

We regret the delayed publication of GBAMS-Vidushi Vol 13,issue 1&2 caused due uncontrollable technical and administrative reasons. We are confident to cope up with the gap and sustain the continuity of the journal.

We always welcome the manuscript that demonstrates a significant value added contribution to the domain of knowledge and understanding.

Our presence on digital platform has been marked for being indexed in Cite Factor, Open Archives, Crossref, PKP google Scholar.

It is only because of the co-operation and patience of our writers that we keep moving ahead despite all the publication related issues.

Alade Ayodeji Ademokoya has pointed out in his paper titled *Impact of Financial Inclusion on Sustainable Development in Sub-Saharan Africa* that all the three aspects of sustainable development, vis-à-vis, sustainable economic, social and environmental development, are crucial, inter-linked and mandatory if the SDGs are to be achieved and they balanced out each other and none is more important than the other. In spite of the bright outlook of financial inclusion derived from financial technology adoption, several challenges still ringer in Sub-Saharan African countries regarding financial inclusion. The study concluded that financial inclusion is vital for sustainable development in Sub-Saharan Africa, primarily, through its contribution to environmental sustainability by reducing environmental degradation through the reduction in CO2 emission. The study recommended that inclusive financial system and activities should be pursued by policy makers of Sub-Saharan Africa in order to achieve their sustainable development goals through improved environmental sustainability.

Prof R.D Sharma in his paper titled *“Dynamics of Campus Politics in Teaching Career of University System”* has elaborated the campus politics on the basis of his direct observation from the education system. The author has indicated the necessity of right kind of efforts from the very beginning on both professional enrichment and procedural formalities contributing academically to the overall development of mankind, no matter what hurdles come in. The clarity about the system and commitment to the job despite all challenging circumstances ultimately result into targeted outcome of visible significance. In fact situation itself guides the nature and extent of efforts and commitments required without diluting moral, ethical and honest value system.

Mr.Prince Kumar paper titled *“Consolidation for effectiveness of Supply chain: A Case Study of Diamond Edge Tools, Varanasi,”* has analyzed the emerging patterns in supply chain incorporation with focus on improving agility of the supply chain. It also explores the relationship between the emerging patterns and attainment of competitive objectives. This paper focuses on the development of a systematic approach with the

following objectives: (1) to enhance responsiveness of supply chain, (2) to use Analytic hierarchy process (AHP) which offers methodology to rank alternative courses of action based on the decision maker's judgment concerning the importance of the criteria and the extent to which they are met by each alternative.

Ms. Seema Garg and Ms. Navita Mahajan have pointed out in the paper *“Integration of Building Information Modelling with Virtual Reality”* that the potential of Building Information Modelling (BIM) is to guide a transformation of the techniques of layout and construction has been obtrusive within the production enterprise. A current BIM subject matter that requires attention is the integration of BIM with Virtual Reality (VR). The use of Building Information Modeling (BIM)-based computer simulation tools is growing rapidly, and such tools assist designers in making better decisions to reduce energy consumption and to create better lighting conditions for occupants. VR combines numerous gadgets for interplay, developing digital surrounding and this must be accompanied by way of research concerning a way to use devices or a way to set up hyperlinks for the presentation of statistics contained in a BIM version. The text offers a review of actual perspective of the use of VR applied in 4D/BIM models.

Mr. Rajiv Ranjan Mishra in his paper titled on *“Role of Mobile library in Globalization Era: A Descriptive Study”* deals with the application and uses of mobile library in new trend. It's all about collaboration of ICT with technology. This research influences the library users to better advancement of mobile libraries services. Mobile libraries were originally seen as a way of offering a library service to those groups who would not otherwise receive one, but nowadays many mobiles offer all the facilities of a modern branch library. The groups of such libraries are considered, together with the services provided and the management decision.

Dr. Shishir Pandey has focused in his paper titled- *“An Analysis of Corporate Earnings in Selected Public Sector Companies in India: Determinants and Problems”* has detailed that the knowledge of past performance is essential to evaluate the investment worth, management success, and creditworthiness of an enterprise. The present study is a work focusing on problems and determinants of corporate earnings of public sector companies in India.

Dr. Shubhendu Shekher Shukla has explained in his paper titled- *“A Study On Effect of E-Commerce With Special Reference To Women's Online Purchasing Behaviour With Flipkart In Lucknow”* that online shopping has become more common over time, in large part because consumers find it convenient to do from the comfort of their home or workplace. The primary goal of this study is to conclude how satisfied customers are with internet shopping. The popularity of E-Commerce starts due to option of COD and EMI option for products.

Last but not the least; we are very thankful to Shri Braj Binani Chairman Binani Industries Ltd, President G.D Education Society and Shri. R.K. Bagri-Secretary, G.d. Binani Education Society and Shri G.S. Newar Vice President, G.d. Binani Education Society, for continuously inspiring us in all the odd circumstances. Our whole team is extremely grateful for their motivational support towards making GBAMS an outstanding institution.

Prof. Dr. Zeeshan Amir
Editor-in Chief

Impact of Financial Inclusion on Sustainable Development in Sub-Saharan Africa

* Alade Ayodeji ADEMOKOYA (Ph.D.)

Abstract

All the three aspects of sustainable development, vis-à-vis, sustainable economic, social and environmental development, are crucial, inter-linked and mandatory if the SDGs are to be achieved and they balanced out each other and none is more important than the other. In spite of the bright outlook of financial inclusion derived from financial technology adoption, several challenges still ringer in Sub-Saharan African countries regarding financial inclusion. This reason and the fact that the impact of financial inclusion on sustainable development has not gained focus in the literature led to the emergence of this study to examine the impact of financial inclusiveness on sustainable development in Sub-Saharan Africa and specifically, to: examine the level of financial inclusion, economic, social and environmental development in Sub-Saharan Africa; assess the impact of financial inclusiveness on sustainable economic development in Sub-Saharan Africa; determine the impact of financial inclusiveness on sustainable social development in Sub-Saharan Africa; and investigate the impact of financial inclusiveness on sustainable environment development in Sub-Saharan Africa. The study employed panel dynamic fixed effects estimator on the panel data of 38 Sub-Sahara African countries over the period between 2012 and 2020. The findings of the study financial inclusion have negative impact on CO₂ emission, implying that financial inclusion improves environmental sustainability but does not have impact on economic and social sustainability. The study concluded that financial inclusion is vital for sustainable development in Sub-Saharan Africa, primarily, through its contribution to environmental sustainability by reducing environmental degradation through the reduction in CO₂ emission. The study recommended that inclusive financial system and activities should be pursued by policy makers of Sub-Saharan Africa in order to achieve their sustainable development goals through improved environmental sustainability.

Keywords: Financial inclusion, Sub Sahara Africa, Sustainable Development

1. Introduction

The sustainable development goals (SDGs) set by the United Nations (UN), which took effect from the end of the millennium development goals (MDGs) in 2015, is comprised of an ambitious 17 goals, with 169 targets and represent a broader scope of developmental objectives expected to guide actions of governments, international agencies, civil society and other institutions for 15 years 2016 to 2030 (United Nations (UN), 2015). The SDGs were born out of the collective realization that for meaningful development to take place globally, a

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paradigm shift is needed that will foster stronger international environmental governance, and ensure a balanced integration of the economic, social and environmental dimensions of sustainable development (United Nations Environmental Programme (UNEP), 2015). All the three aspects of sustainable development are crucial, inter-linked and mandatory if the SDGs are to be achieved and they balanced out each other and none is more important than the other. Only by integrating and interlinking economic, social and environmental sustainability can negative synergies be arrested, positive synergies fostered, and real development encouraged (Demircuc-Kunt, Klapper, Singer & Oudheusden, 2015). Economic, social and environmental sustainability form elements of a dynamic system. Therefore, they cannot be pursued in isolation for sustainable development to flourish. It becomes pertinent to determine the factors that can help foster these three sustainable development branches. One of the most talked-about factors that can guarantee sustainable development from these three perspectives is the level of financial development in the country. A more developed financial system can facilitate the much-needed financial resources for economic, social and environmental development (Ademokoya, 2020). More specifically, the level of financial inclusion can foster sustainable development in these three regards. Although, the SDGs do not explicitly target financial inclusion, greater access to financial services is a key enabler for many of them.

Sub-Saharan African (SSA) countries have achieved milestones in financial inclusion, particularly on penetration, access, and usage dimensions. This outcome has been driven mainly by mobile money services as a platform for financial services delivery. Substantial increase in usage of formal non-bank financial services is notable, especially in the middle-income countries, such as Nigeria, Mauritius, Seychelles, South Africa, Namibia and Morocco (Balele, 2019).

In spite of the bright outlook of financial inclusion derived from financial technology adoption, several challenges still ringer in Sub-Saharan African countries regarding financial inclusion. These include limited outreach of the brick and mortar model, especially in rural areas, high and sticky levels of financial illiteracy, high lending rates leading to significant spread between lending and deposit rates, and low saving and poor loan repayment culture (Dabla-Norris, Ji, Townsend & Unsal, 2015). The banking infrastructure is still less developed in most SSA countries, with most of the banking services concentrated in urban areas. Other challenges include the predominance of cash-based economy (Adam, Kessy, Nyella & O'Connell, 2010), default risk attributed by absence of collateral registry for registration of movable assets, and higher degree of informal sector. Scheneider, Buenhn and Motenegro (2010) identified Mozambique, Tanzania, and Nigeria as countries with the highest proportion of shadow economy, with 58.3%, 56.4%, and 55.2%, respectively. Dell'Anno, Davidescu and Balele (2018) found that the Tanzanian shadow economy ranged between 50% and 61% during 2004-2014). All these factors exert friction on the speed of financial inclusion in SSA despite the adoption of financial technology.

Furthermore, the level economic, social and environmental development in Sub-Saharan Africa has not been encouraging, most especially, in the case of environmental development (Ademokoya, 2020). The environment appears to have been neglected for long when it comes

to developmental issues (Norbert & Saleh, 2003). Naturally, the environment has an epidemiologic or determinant role when it comes to sustainable development.

Despite the overwhelming consensus on the role of financial inclusion on economic growth (Aker, Boumijel, McClelland & Tierney, 2011; Andrianaivo & Kpodar, 2011; Bruce, Gine, Goldberg & Yang, 2013; Harihanan & Marktanner, 2012), the impact of financial inclusion on sustainable development has not gained focus in the literature. This study is therefore motivated by this absence of attention being given to investigating this phenomenon. This led to the emergence of this study to investigate: the impact of financial inclusiveness on sustainable economic development in Sub-Saharan Africa; the impact of financial inclusiveness on sustainable social development in Sub-Saharan Africa; and the impact of financial inclusiveness on sustainable environment development in Sub-Saharan Africa.

2. Literature Review

Review of Concepts

Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It therefore depends on how effectively the present and future social, economic, and environmental needs are balanced when making the decision today (United Nations, 2015).

The three pillars of sustainable development, vis-à-vis economic growth, environmental stewardship, and social inclusion carry across all sectors of development, from cities facing rapid urbanization to agriculture, infrastructure, energy development and use, water availability, and transportation (Omar & Inaba, 2020). Many of these objectives may seem to conflict with each other in the short term. For example, industrial growth might conflict with preserving natural resources. Yet, in the long term, responsible use of natural resources now will help ensure that there are resources available for sustained industrial growth far into the future (United Nations Environmental Programme, 2015).

While economic sustainability implies a system of production that satisfies present consumption levels without compromising future needs, social sustainability implies a system of social organization that alleviates poverty and social inequality and environmental sustainability requires maintaining natural capital as both a provider of economic inputs (called 'sources') and an absorber (called 'sinks') of economic outputs (called 'wastes') (Serageldin, 1993)

On the other hand, financial inclusion is the sustainable provision of affordable financial services that bring the poor into the formal economy (United Nations, 2016). Financial inclusion may also be defined as the use of formal financial services by the poor (Beck, Demirgüç-Kunt & Levine, 2007; Bruhn and Love, 2014).

Theoretical Review

Both the financial repression and financial intermediation theory provide theoretical background to this study, in that they establish the foundation to which the making or removal of government policies could promote more financial inclusion (or financial exclusion) which will further establish (or deter) a sustainable economic, social and environmental development in the society. As for the financial repression theory by Mckinnon (1973) and

Shaw (1973), it posits that excessive government regulations and laws such as interest rate control, liquidity ratio requirements, high reserve requirement, high transaction cost, capital controls, restrictions on entry into the financial sector, restrictions on directions or allocation of credit, government ownership or domination of banks and other legal restrictions affect effective financial intermediation in an economy. The financial intermediation on the other hand, established the extent to which financial institution connect the deficit spending units and surplus spending units together (Ndebbio, 2004).

Linking the two theories to the study, the financial repression theory advocates for the removal of government policies and initiatives that could discourage savings and lending in the country's financial system and retain those that foster financial inclusion. If after measuring financial inclusion in Nigeria, the index is seen as low, this theory suggests the removal of those government policies and initiatives as indicated by the index to be hindering financial inclusion and if it increases, the theory suggest the retention of those policies and initiatives as the index indicates. Furthermore the financial intermediaries perform the function of distribution of information and reduction of transaction cost, greater number of people will further use the financial services, thereby reducing the rate of financial exclusion.

Empirical Review

A number of studies conducted for developed economies have demonstrated research efforts to investigate the role of financial inclusion on macroeconomic conditions in general, and on economic growth in particular (e.g., Levine *et al.*, 2000; Hariharan & Marktanner, 2012; Yorulmaz, 2016). The focus of these studies were not channelled towards the impact of financial inclusion on sustainable development. The only exception is the study by Cichowicz and Rollnik-Sadowska (2018), which was conducted on the impact of inclusive growth on sustainable development in Central and Eastern European countries. The studies conducted for developing countries (e.g., Andrianaivo & Kpodar, 2011; Hariharan & Marktanner, 2012; Zuzana Fungáčová & Weill, 2014; Park and Mercado, 2015) were also majorly on the impact of financial inclusion on economic growth and poverty but not sustainable development. However, the study by Koirala and Pradhan (2019) was on other macroeconomic determinants aside financial inclusion on sustainable development.

Similarly, for studies in SSA, most of them were conducted on impact of financial inclusion on economic growth and development (see, for example, Aina & Oluyombo, 2014; Micheal, 2014; Onaolapo, 2015; Nkwede, 2015; Adetiloye, Erin & Modebe, 2017), with no attention given to sustainable development. The only exception is the study by Yakubu, Loganathan and Ali (2019), which was conducted to examine the impact of financial and economic factors on sustainable economic performance. Even at that, Yakubu *et al.*, (2019) did not specifically looked at financial inclusion, more so, the study is only specific to sustainable economic development economic, which is just an aspect of overall sustainable development. This shows that there is a gap in the empirical literature regarding the impact of financial inclusion on sustainable development.

Furthermore, the studies mentioned above were basically conducted on either static time series or static panel analysis, making them to ignore the dynamism that may exist in the relationship between financial inclusion and sustainable development. This also indicates a

methodological gap in the empirical literature which seeks to be filled. More so, the use of only sustainable economic development which was employed in the work of Yakubu *et al.* (2019) is not suitable for overall sustainable development, as sustainable development encompasses economic, social and environmental sustainability. This also indicates a conceptual and variable measurement gap which seeks to be filled.

The present study therefore fills the above-mentioned gaps by examining the impact of financial inclusion on sustainable development in Sub-Saharan Africa, employing a dynamic panel autoregressive distributive lag (ARDL) model in order to capture the dynamic relationship. The study employed three measures viz: economic growth (for economic sustainability), income inequality (for social sustainability) and carbon emission (for environmental sustainability).

$$C_t = \alpha_0 + \alpha_1 \ln E_t + \alpha_2 \ln Y_t + \alpha_3 \ln F_t + \alpha_4 \ln TR_{it} + \mu_{it} \quad (1)$$

where:

C is CO₂ emissions per capita

E is energy consumption per capita

Y is real GDP per capita

F is financial development

TR is trade openness

The modifications include the transformation of the focus of the model from just environmental sustainability to include economic sustainability and social sustainability. The empirical models of this study is therefore given as follows.

Model for Economic Sustainability

$$GDPgr_{it} = \alpha_0 + \alpha_1 POPgr_{it} + \alpha_2 GCF_{it} + \alpha_3 TOP_{it} + \alpha_4 FI_{it} + \varepsilon_{it} \quad (2)$$

where:

GDPgr is economic growth

POPgr is population growth

GCF is gross capital formation

TOP is trade openness

FI is financial inclusiveness

ε is the disturbance term of the model

α_0 is the constant term

$\alpha_1 - \alpha_4$ are the coefficients of the variables included in the model

A priori Expectation

The expected signs of the coefficients of the variables included in the above model are discussed here. It is expected that population growth, capital formation, trade openness and financial inclusiveness have positive signs and thus, have positive impacts on economic sustainability. This can be summarized in the following inequality notations.

$$\alpha_1, \alpha_2, \alpha_3, \alpha_4 > 0$$

Model for Social Sustainability

$$Gini_{it} = \beta_0 + \beta_1 GDPgr_{it} + \beta_2 GEF_{it} + \beta_3 RegQ_{it} + \beta_4 TOP_{it} + \beta_5 FI_{it} + \epsilon_{it} \quad (3)$$

where:

Gini is Gini coefficient (income inequality)

GEF is government effectiveness

RegQ is regulatory quality

ϵ is the disturbance term of the model

Other variables are as defined earlier

β_0 is the constant term

$\beta_1 - \beta_5$ are the coefficients of the variables included in the model

A priori Expectation

It is expected that economic growth, government effectiveness, regulatory quality trade openness and financial inclusiveness have positive signs and thus, increase the Gini coefficient, thereby reducing income inequality and having improving the social sustainability. This can be summarized in the following inequality notations.

$$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$$

Model for Environmental Sustainability

$$CO2_{it} = \theta_0 + \theta_1 GDPgr_{it} + \theta_2 GEF_{it} + \theta_3 RegQ_{it} + \theta_4 TOP_{it} + \theta_5 FI_{it} + \mu_{it} \quad (4)$$

where:

μ is the disturbance term of the model

Other variables are as defined earlier

θ_0 is the constant term

$\theta_1 - \theta_5$ are the coefficients of the variables included in the model

A priori Expectation

It is expected that economic growth has a positive sign, thereby increasing CO2 emission and contributing negatively to environmental sustainability. On the other hand, government effectiveness, regulatory quality trade openness and financial inclusiveness have negative signs and thus, reducing CO2 emission, thereby improving the environmental sustainability. This can be summarized in the following inequality notations.

$$\theta_1 > 0; \theta_2, \theta_3, \theta_4, \theta_5 < 0$$

Research Design

This study adopted the *ex-post* facto research design. This research design is appropriate for this study because of its peculiar features of examining existing facts and utilizing existing (secondary) source of data. Also, *ex-post* facto is suitable for this study used because it examines how independent variables present in prior study affect the dependent variable.

Population and Sample Size

The population of the study is made up of all forty-nine (49) countries in Sub-Saharan Africa, while the sample of the study covers thirty-eight (38) based data availability on financial inclusion and economic, social and environmental sustainability. These thirty-eight (38) countries include: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central Africa Republic, Chad, Comoros, Congo Dem. Rep., Congo Rep., Cote d'Ivoire, Djibouti, Eswatini, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

Source of Data Collection

Secondary source of data was used for this study. The secondary data used in this study have been extensively sourced from the World Bank's World Development Indicators (WDI) and Global Financial Index (FINDEX) of 2021.

Method of Data Analysis

This study applied the dynamic panel estimators to test for the long-run relationship and obtain the long-run estimates of the financial inclusion sustainable development. The estimation technique was macro panel data analysis, which deals with large number of time period (T) relative to number of cross-sections (N) or large number of both the periods and cross-sections. In the case of large T and small N, Roodman (2009) asserted that GMM estimators would produce spurious results due to the following reasons: (1) As T becomes larger, the instruments increase too, which subsequently affect the validity of Sargan test of over-identifying restriction. As such, the null hypothesis of exogeneity of instruments may be unnecessarily rejected. This can lead to doubt about the validity of the estimates. (2) Having small N can lead to a doubtful or unreliable autocorrelation test. In general, the application of GMM estimators in such situation may result in inconsistent and unreliable results. The suitable estimators for such panel setting are panel ARDL estimators, which include mean group (MG), pooled mean group (PMG), and dynamic fixed effect (DFE).

To specify the model of this study, it is pertinent to note that Pesaran *et al.*, (1999), Loayza and Ranciere (2006), and Samargandi *et al.*, (2015) asserted that dynamic heterogeneous panel could be incorporated into an error correction model based on ARDL (p,q) approach, with p as the dependent variable's lag and q as regressors' lag.

4. Results and Discussions

This section presents the results of both the descriptive and inferential analyses. While the summary statistic tools of mean, standard deviation minimum and maximum were employed to describe the variables of this study, the main inferential analysis tool employed here is regression analysis, which is to examine the effect of financial inclusion on sustainable development in Sub-Saharan Africa.

Descriptive Statistics

Table 1: Results of Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
GDGgr (in %)	4.21	4.34	-36.39	20.72
Gini (in %)	43.27	7.15	31.50	63.00
CO2 (in tonnes)	21,057.84	76,757.34	135.68	484,495
FI (index)	0.30	0.16	0.01	0.76
POPgr (in %)	2.43	0.83	0.03	3.91
GCF (in % of GDP)	23.22	9.19	-0.10	77.89
TOP (in % of GDP)	73.30	44.51	16.67	348.00
GEX (in dollars)	5,410,000,000	12,600,000,000	102,000,000	82,700,000,000
GEF (in % rank)	26.29	19.56	0.95	81.73
RegQ (in % rank)	30.20	18.56	1.90	83.65

Source: Author's Computation, 2022.

The summary statistics results presented in Table 4.1 shows that GDP growth (which measures economic sustainability) has a mean value of 4.21, standard deviations of 4.34, minimum value of -36.39 and maximum value of 20.72. This indicates that the sampled SSA countries, on the average, recorded economic growth to the tune of 4.21 per cent. The standard deviation also suggest that these countries are unequal in terms of their economic growth. The result also indicates that the country with the lowest economic growth during the period recorded a negative growth of -36.39 percent. On the other hand, the country with the highest economic growth during the period recorded it as a very high 20.72 per cent.

Table 4.1 also shows that Gini coefficient, which measures the level of inequality (and is used to proxy social sustainability) has a mean value of 43.27, standard deviation of 7.15, minimum of 31.50 and maximum of 63.0. This indicates that the sampled SSA countries, on the average, have 43.27 value out of 100 in terms of Gini coefficient, suggesting that they are widely unequal. This has a minimal spread of 7.15. The result also indicates that the country with the lowest Gini coefficient (and highest inequality) has 31.50 out of 100, while the country with the highest Gini coefficient (and lowest inequality) has 63 out of 100.

The results also show that CO2 emission, (used to proxy environmental sustainability) has a mean value of 21,057.84, standard deviation of 76,757.34, minimum of 135.68 and maximum of 484,495.0. This indicates that the sampled SSA countries, on the average, emit 21,057.84 tonnes of carbon on an annual basis. This has a wide spread of 76,757.34 tonnes. The result also indicates that the country with the lowest CO2 emission emit 135.68 tonnes per year, while the country with the highest CO2 emission emit 484,495 tonnes per year.

The summary statistics results show that financial inclusion, has a mean value of 0.30, standard deviation of 0.16, minimum of 0.01 and maximum of 0.76. This indicates that the sampled SSA countries, on the average, have an index score of 0.3 out of 1 in terms of their inclusiveness. This is quite small. This is also minimally spread by of 0.16. The result also indicates that the country with the lowest financial inclusion during the period has a value of 0.01, while the country with the highest financial inclusion during the period has a value of 0.76 out of 1.

The summary statistics results presented in Table 4.1 shows that population growth has a mean value of 2.43, standard deviations of 0.83, minimum value of 0.03 and maximum value of 3.91. This indicates that the sampled SSA countries, on the average, recorded population growth to the tune of 2.43 per cent. The standard deviation also suggest that these countries are minimally spread in terms of their population growth. The result also indicates that the country with the lowest population growth during the period recorded it as 0.03 percent. On the other hand, the country with the highest population growth during the period recorded it as 3.91 per cent.

The results also shows that gross capital formation as ratio of GDP has a mean value of 23.22, standard deviations of 9.19, minimum value of -0.10 and maximum value of 77.89. This indicates that the sampled SSA countries, on the average, recorded gross capital formation as percent of GDP to the tune of 23.22 per cent. The standard deviation suggests that these countries are minimally spread in terms of their capital formation. The result also indicates that the country with the lowest capital formation during the period recorded it as a negative 0.10 percent of GDP. On the other hand, the country with the highest capital formation during the period recorded it as 77.89 per cent of GDP.

Trade as ratio of GDP (which measures trade openness) has a mean value of 73.30, standard deviations of 44.51, minimum value of 16.67 and maximum value of 348.0. This indicates that the sampled SSA countries, on the average, recorded trade openness as percent of GDP to the tune of 77.3 per cent. The standard deviation suggests that these countries are widely spread apart in terms of their trade openness. The result also indicates that the country with the lowest trade openness during the period recorded it as 16.67 percent of GDP, while the country with the highest trade openness during the period recorded it as 348 per cent of GDP.

Government expenditure has a mean value of 5,410,000,000, standard deviations of 12,600,000,000, minimum value of 102,000,000 and maximum value of 82,700,000,000. This indicates that the governments of the sampled SSA countries, on the average, spend about 5.41 billion dollars annually. The standard deviation suggests that these expenditures are widely spread apart from country to country. The result also indicates that the country with the lowest government expenditure during the period recorded it as 102 million dollars, while the country with the highest government expenditure during the period recorded it as 82.7 billion dollars.

Government effectiveness has a mean value of 26.29, standard deviations of 19.56, minimum value of 0.95 and maximum value of 81.73. This indicates that, on the average, the sampled SSA countries have a score for government effectiveness of 26.29 in percentile rank. The standard deviation suggests that these countries are spread apart by 19.56 in percentile rank. The result also indicates that the country with the lowest government effectiveness during the period recorded it as 0.95 in percentile rank, while the country with the highest government effectiveness during the period recorded it as 81.73 in percentile rank.

Regulatory quality has a mean value of 30.20, standard deviations of 18.56, minimum value of 1.90 and maximum value of 83.65. This indicates that, on the average, the sampled SSA countries have a score for regulatory quality of 30.20 in percentile rank. The standard deviation suggests that these countries are spread apart by 18.56 in percentile rank. The result also indicates that the country with the lowest regulatory quality during the period recorded it as 1.90 in percentile rank, while the country with the highest regulatory quality during the period recorded it as 83.65 in percentile rank.

Dynamic Fixed Effects Results

The results of dynamic fixed effects variant of the panel ARDL method is presented in Table 2 to examine the impact of financial inclusiveness on economic sustainability in Sub-Saharan Africa. Both the short and long run estimates are presented with the long run estimates are presented in the upper part of the table, the short run estimates are presented in the lower part of the table.

From the long run estimates, the result shows that population growth (POPgr), gross capital formation (GCF) and trade openness (TOP) have statistically significant positive coefficients (5.273, 0.131 and 0.049 with p-values of 0.001, 0.028 and 0.092 respectively). However, financial inclusion is seen with an insignificant coefficient (78.38 with p-value of 0.114). These indicate that population growth, gross capital formation and trade openness have long-run positive impacts on economic growth while financial inclusion does not have statistically significant long-run impact on economic growth. This simply implies that long-run economic sustainability of SSA countries is determined by population growth, capital formation and trade openness and not by financial inclusion. The significant positive coefficient of population growth indicates that a per cent point increase in growth of population in SSA will lead to a long-run rise in economic sustainability by approximately 5.27 per cent points. Similarly, the significant positive coefficient of capital formation indicates that a point increase in ratio of capital formation to GDP will lead to a long-run rise in economic sustainability of SSA countries by approximately 0.13 per cent points. Also, the significant positive coefficient of trade openness indicates that a point increase in the ratio of trade to GDP will lead to a long-run rise in economic sustainability of SSA countries by approximately 0.05 per cent points.

From the short-run estimates, population growth and trade openness (TOP) have statistically significant positive coefficients (10.22 and 0.083 with p-values of 0.009 and 0.002 respectively). However, gross capital formation and financial inclusion are seen with an insignificant coefficient (0.039 and 35.69 with p-values of 0.377 and 0.260). These indicate that population growth and trade openness have short-run positive impacts on economic growth while gross capital formation and financial inclusion does not have statistically significant short-run impact on economic growth. This simply implies that short-run economic sustainability of SSA countries is determined by population growth and trade openness but not by capital formation and financial inclusion.

The results of dynamic fixed effects variant of the panel ARDL method is presented in Table 3 to examine the impact of financial inclusiveness on social sustainability in Sub-Saharan Africa. From the long run estimates, the result shows that only regulatory quality (RegQ) has a statistically significant negative coefficient (-0.078 with p-values of 0.048). Economic growth (GDPgr), government effectiveness (GEF), trade openness (TOP) and financial inclusion (FI) are seen with insignificant coefficients (-0.008, -0.032, 0.003, and -17.69 with p-values of 0.823, 0.385, 0.752 and 0.398). These indicate that regulatory quality has a long-run negative impact on Gini coefficient and in turn reduces income inequality, while economic growth, government effectiveness, trade openness and financial inclusion do not have statistically significant long-run impact on Gini coefficient and in turn, on income inequality. This simply implies that long-run social sustainability of SSA countries is determined by regulatory quality, but not economic growth, government effectiveness, trade openness and financial inclusion.

Table 2: Dynamic Fixed Effects Regression Results for Economic Sustainability

Table 2: Dynamic Fixed Effects Regression Results for Economic Sustainability

Variable	Coefficient	z	p-value
Long-Run Estimates			
POPgr	5.273	3.25	0.001
GCF	0.131	2.2	0.028
TOP	0.049	1.68	0.092
FI	78.38	1.58	0.114
Short-Run Estimates			
Δ GDPgr(-1)	0.926	14.45	0.000
Δ POPgr	10.22	2.62	0.009
Δ GCF	0.039	0.88	0.377
Δ TOP	0.083	3.12	0.002
Δ FI	35.69	1.13	0.260
Constant	35.63	2.48	0.013

Source: Author's Computation, 2022.

Table 3: Dynamic Fixed Effects Regression Results for Social Sustainability

Variable	Coefficient	z	p-value
Long-Run Estimates			
GDPgr	-0.008	-0.22	0.823
GEF	-0.032	-0.87	0.385
RegQ	-0.078	-1.97	0.048
TOP	0.003	0.32	0.752
FI	-17.69	-0.84	0.398
Short-Run Estimates			
Δ Gini(-1)	0.215	4.74	0.000
Δ GDPgr	-0.003	-0.5	0.619
Δ GEF	-0.002	-0.27	0.788
Δ RegQ	-0.013	-1.46	0.144
Δ TOP	-0.001	-0.41	0.685
Δ FI	-2.901	-0.92	0.355
Constant	-11.05	-4.3	0.000

Source: Author's Computation, 2022.

From the short-run estimates, none of the variables is seen to significant coefficient. These indicate that none of the variables have short-run impact on income inequality. This simply implies that short-run social sustainability of SSA countries is not determined by economic growth, government effectiveness, regulatory quality, trade openness and financial inclusion. The results of dynamic fixed effects variant of the panel ARDL method is presented in Table 4 to examine the impact of financial inclusiveness on environmental sustainability in Sub-Saharan Africa. From the long run estimates, the result shows that only trade openness (TOP) and financial inclusion (FI) have statistically significant negative coefficient (-18.29 and -

33307.2 with p-values of 0.063 and 0.051). Economic growth (GDPgr), government effectiveness (GEF), regulatory quality (RegQ) are seen with insignificant coefficients (16.44, -16.43 and -3.476 with p-values of 0.593, 0.575 and 0.909). These indicate that trade openness and financial inclusion have long-run negative impacts on CO2 emission and in turn reduces environmental degradation, while economic growth, government effectiveness and regulatory quality do not have statistically significant long-run impact on CO2 emission and in turn, on environmental degradation. This simply implies that long-run environmental sustainability of SSA countries is determined by trade openness and financial inclusion, but not economic growth, government effectiveness and regulatory quality.

From the short-run estimates, none of the variables is seen to significant coefficient. These indicate that none of the variables have short-run impact on CO2 emission. This simply implies that short-run environmental sustainability of SSA countries is not determined by economic growth, government effectiveness, regulatory quality, trade openness and financial inclusion.

Table 4: Dynamic Fixed Effects Regression Results for Environmental Sustainability

Variable	Coefficient	z	p-value
Long-Run Estimates			
GDPgr	16.44	0.53	0.593
GEF	-16.43	-0.56	0.575
RegQ	-3.476	-0.11	0.909
TOP	-18.293	-1.86	0.063
FI	-33307.2	-1.96	0.051
Short-Run Estimates			
Δ Gini(-1)	1.314	19.7	0.000
Δ GDPgr	19.29	0.65	0.518
Δ GEF	-6.802	-0.17	0.868
Δ RegQ	-0.932	-0.02	0.984
Δ TOP	-1.163	-0.1	0.923
Δ FI	-9917.7	-0.65	0.513
Constant	-42976.1	-6.3	0.000

Source: Author’s Computation, 2022.

From the findings of this study, it was largely revealed that all the variables took the right signs as expected, *a priori*. For example, the positive impacts of population growth, capital formation and trade openness on economic sustainability; the positive impact of regulatory quality on social sustainability; and the positive impacts of trade openness and financial inclusion on environmental sustainability are all in line with the *a priori* expectation and supported by the findings of Liu *et al.*, (2019), Koirala and Pradhan (2019), Nkwede (2015), Adetiloye *et al.* (2017), Cámara and Tuesta (2014), Jishajoseph and Varghese (2014) and Norris *et al.* (2015).

5. Conclusions and Recommendations

The study examined the impact of financial inclusion on economic, social and environmental sustainability in SSA countries. The conclusions that emerged from the findings are therefore that financial inclusion is only helpful in reducing carbon emission and guarantee environmental sustainability for the region but does not promote both economic and social sustainability. It is also concluded that population growth, capital formation and trade openness are vital for economic sustainability, strong regulatory quality is needed for social sustainability and trade openness is relevant for environmental sustainability. The study therefore recommends that to achieve sustainable economic, social and environmental development in SSA, policymakers should devote policy efforts to promote the growth of population, levels of investment and the openness to international trade, as well as the further inclusion of individuals of the region in the financial system.

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Dynamics of Campus Politics in Teaching Career of University System

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Teaching is widely known as a unique noble profession of multifaceted challenges throughout as it contributes immensely in strengthening society and mankind ultimately all times and in all settings. It gives lot of satisfaction of paramount significance, respect and great opportunity to teachers personally to live a very meaningfully comfortable life vis-a-vis contribute tremendously for the betterment of the mankind as a whole provided they remain always particular to their conduct, character, confidence and commitment in their role by producing always quality students with humane values as professionally successful global citizens that too by flawlessly meeting the fast changing teaching job requirements and challenges which are always different at primary, secondary and higher levels both in private and public educational institutions in different nation-state settings as well as locally relevant peculiar conditions. For example over a period of time, pre-primary play-way learning practice in formal setting is of recent origin on account of non-availability of parents to their kids at home for the traditional home grooming care up to their school going age due to socio-economic compulsions and so called modern way of life, yet each level of teaching gives shape to the nation by building all round personality of the students, of course with the adequate equally needed contributions in an integrated way by all the other stakeholders including parents, socio-cultural value system, regulating structures and legal obligations etc. However, still higher education has its own inbuilt challenges and opportunities particularly within the framework of new education policy.

Just after a limited spell of about four month service in a private higher secondary school, which proved very useful that time due to personal economic conditions and academic significance, the author of the paper joined higher education as Lecturer in Commerce at University level on regular basis on February 14, 1981 through all India competition. Teaching carrier in higher education always remains very challenging due to multi-dimensional regularly targeted efforts needed in a particular area of specialisation in a planned way to remain ever ready which invariably include literature updates, active participation in seminars, workshops, conferences, research projects, extension works, collaborations, exchange activities, and quality publications etc. Accordingly the author did try his level best to do justice with the aforesaid job requirements from the very beginning yet given work culture, overall institutional environment and job challenging dynamics influenced the quality of his efforts vis-a-vis outcome of the same quite significantly. Virtually the perception of proper specialisation in university education was missing in overall system itself and only

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teaching the students to make them get through with good marks was the prime responsibility perceived in teaching, however unlike in well meaning universities and institutions of eminence contributing to the relevant local and national needs of universal perspective through research based addition to literature and applications of knowledge consistently. Till he joined the university on regular basis after working on academic arrangement for about five months, the author was assigned classes in Marketing Management in a PG Diploma Programme and Personnel Management in another PG Diploma Programme. Subsequently he had also to take classes in Business Taxation and Statistics of Master Degree Programme and thus there was hardly any focus and motivation on enriching one area of specialisation as required in university level of research intensive higher education world over. In fact a faculty member can do too limited justice at master degree level teaching in four different areas of the discipline instead of doing in-depth literature review and research work simultaneously along with teaching vis-a-vis having all round active involvement in the innovative academic activities in his/her own area of interest and specialisation. However the author was supposed to carry his teaching responsibility in three different PG Programmes with four different papers as per teaching workload assigned as a routine. Interestingly it was not a special case with him only but this work culture of non-research linked teaching pursued in majority of the departments of the university. This practice did not stop only here but whenever some stop gap academic arrangements became urgent it was done with additional workload to the author only, being the junior most till April 18, 1987 i.e. during this time he had also to teach Basic Principles of Management and Advanced Accounts to M. Com. students in addition to aforesaid routine workload amounting to six areas of teaching. Thus the author had no obligation for any kinds of research and extension activities and that is why he was supposed to take classes in six different papers that too with frequent changes as and when need had arisen in the department due to changes in course curriculum and other forms of manpower requirements. Such a heavy teaching workload does give broader horizon in the initial stage of the career yet at the cost of research oriented innovations in academics. In fact such a culture of just teaching without integrating it with all other connected academic activities of the university's basic task was the outgrowth of tremendous class workload due to inadequate faculty as per prescribed teacher-student ratio vis-a-vis inability of the system in filling up vacant positions on account of multicentre pulls and pressures in the university system. Similarly even students didn't ever think of demanding quality teaching and were always eager to continue with same ongoing mere teaching practice and so much so the teachers having done in-depth literature review work and/or applying project ways and innovative case studies in teaching rarely got due facilities and encouragements as a common practice in most of the teaching departments. Thus vicious circle of just borrowing the knowledge from the routine text books and sharing the same with the students in the class that too within selected syllabus as per past practice of providing guess question papers to the students for examinations got further strengthened with stereo type question papers on simple aspects of studies i.e. just very easy questions on the basic conceptual and elementary issues to the students to write answers and get through with good marks. Very rarely twisted questions demanding adequate application of mind by the students while writing answers happened to figure in the examination and whenever happened it used to be perceived as question paper

out of syllabus or beyond the normal standard followed. So much so such a badly needed departure in isolated cases would lead to boycotting the examinations and even getting grace marks if examinations held vis-a-vis giving bad name to such hard working teachers teaching the course in question through case studies and analytical way with much more active student participation in class and homework required. As per requirements enshrined through notifications by the regulating bodies in different streams of higher education, such a practice is a regular feature in well meaning institutions of higher learning. Consequently all this led to emergence of a visible culture of awarding only paper qualification i.e. producing jacks of all trades and master of none both in teaching and learning in conflict to very basics of higher education system and thus producing the unemployable youth. The author had understood this inbuilt compulsion due to limited resources of the system and absence of any demand for such efforts for continuing with this culture yet along with some research, publications and extension activities too on his own.

It may not be out of place to mention that wrong working trend in a public educational institution once begins it gets continuously strengthened further due to heavy presence of such a mediocrity and with the passage of time all the connected requisite activities and job requirements prescribed even by the concerned regulating bodies in higher education like UGC, AICTE etc get weakened, ineffective, ignored and relaxed, making the vicious cycle of poor work culture and performance to continue in spoiling the whole system till some bold and meaningful anti-status quo steps for creatively innovative inputs take place. In fact when the author joined as Lecturer in Commerce at Jammu University, both the then departments of the faculty of business education, viz., Department of Commerce and Management Studies had a few faculty members holding senior positions of Professor and Readers/Associate Professors for building the needed sound culture and thus majority of teachers were Lecturers/Assistant Professors and there was joint teaching arrangement in these departments. As per the then practice there was a common time table for all the faculty members of both the departments as per their multiple specialisations and each one was given teaching responsibility in both the departments. For promotion purposes from Lecturer to Reader and Reader to Professor the overall seniority of the internal candidates used to be given due cognisance informally where ever senior position had to be filled up i.e. in Commerce or Management. Surprisingly majority of the Lecturers of both the Departments had not done Ph. D. till late 1980s and this seen was likely to continue had some psychological pressure in the form of better performance by the younger faculty not done so early. Senior positions were very rarely filled with external candidates with too limited competition. So much so other directly related academic activities, particularly publications, collaborations, participations in academic meets with paper presentations and project works remained almost missing in most of such state universities. So much so any of the faculty members if happened to take some interest in these activities would have to face very tough times due to limited exposures and jealousy including strong cartelisation by status quo team on the campus against him/her in an organised and calculated manner, however certainly in informal way. Virtually it was not the fault of the cartel teams as they had learnt to live like this only. Quite often the author had experienced too much suffocation under the circumstances yet he

was determined to be much more productive and meaningful to the system in bringing change as enshrined in the norms of the university system and regulating agencies. In fact Senior Positions of Professor and Associate Professor are available with full justification of visible innovative teaching and research carried within reasonable period of time, indicating compellingly expected potential for excellent academic contribution of far reaching significance of global perspective. Soon after appointment as Lecturer in Commerce, the process of Ph. D. Research work of the author got slow due to foresaid too much teaching workload and overall work environment, lack of required exposure and support, particularly with regards to selection of supervisor even on account of just primary school like teaching culture and the then job requirements on the ground against any innovations and creativity of higher education. So much so the faculty members intentionally but unofficially were divided into groups apparently led by their supervisors within the faculty not for any academic considerations but as their respective lobby to strengthen own interest of continuing this mediocrity unchallenged and pressure free due to such whole scenario of limited expectations and vision as if it was the only rule of the game in the system. The author on the basis of his own limited judgement and exposure in this scenario did have in his mind the name of one of the faculty members as his supervisor for Ph. D. Research work, yet he remained indecisive due to the fear of being branded as integral part of the lobby led by that person/supervisor. There were four approved research guides available in both the departments of the faculty belonging to two such informal pressure groups. Thus just within few months of his working in the university on regular basis he found all the faculty members divided into two groups due to very minor personal interest and thus internal unproductive dirty politics, suffocating straight forward people having some “time bound vision and mission” for betterment of mankind vis-à-vis their own career building requirements. Having found such an atmosphere in the Faculty of Commerce, the author had to spend lot of time just in the selection of the supervisor for his Ph. D. Degree. Though under rules as prescribed the supervisors are allotted by the competent authority in the university on the basis of academic considerations only yet choice of the candidate invariably remains the most important factor. Getting supervisor from outside the department was also not possible so smoothly as no proper guideline existed to overcome this hidden unethical practice. Hence there was hardly any option left to the author except to be identified as a branded man of the lobby led by his supervisor. After wasting lot of time for such a routine issue and also considering very inappropriate that time to take leave from the job for doing Ph. D. in some other institution elsewhere, the author took the risk and submitted finally his application after the loss of almost one year just for registration for doing Ph. D. research work in Commerce of Jammu University under the supervision of Prof. N. S. Gupta as the most suitable choice to him under all these circumstances, however purely on academic considerations and also internally getting ready to face all kinds of aforesaid challenges.

As expected even after registration for pursuing Ph. D. research work, the process didn't remain smooth and hurdles free due to the said lobby culture not for encouraging and maintaining creative efforts but shockingly for continuing with this culture moving around the then ongoing mediocrity in all fronts. In fact easy entry to such challenging jobs makes too

limited demand for further visible improvements and thus such elements gang up for meeting their own too narrow gains by stalling meaningful inputs by non-gang members. So much so none of those working as Lecturers without Ph. D. degree would remain comfortable and positive with their younger colleagues doing the research on priority and getting involved in institutional activities of long term academic values as they (lobby members) would feel threatened of becoming junior to them (hard workers) in near future at the time of recruitment for senior position as Ph. D. remained invariably essential requirement for promotion. In fact the author could not avail even study leave as permissible under rules due to the non availability of his substitute for taking classes during his absence on this account. So much so when his reach work for Ph. D. degree reached near completion and he applied for delimiting the topic before submitting the thesis as prescribed under rules, the same was given interpretation of being new topic, thus forcefully attempting to compel him to start afresh so that he would spend another three years or alternatively run way from JU due to such suffocating environment. However the then Vice Chancellor late Prof. M. R. Puri could understand the working of all this negative mechanism on account of lobby culture and thus he obtained expert opinion on the issue from outside and placed the whole issue before the upper competent statutory body of the university for appropriate decision and thus the author was finally allowed to submit his Ph. D. thesis for evaluation after the expiry of stipulated duration of research work carried. Surprisingly the matter still remained under the slow process of evaluation on one pretext or the other resulting into further loss of time that his viva voce could finally be conducted after about ten months from the date of submission of the thesis. It may not be out of place to mention that there were numerous cases even where result of Ph D viva voce was declared on the date when last evaluation report received along with its conduct same day and thus total time taken after submission of thesis not more than a month, thanks to uncharitably discriminatory working of the system due to lobby culture against the interest of justice to all and fair play. In fact it was overall environment where hardly any effort, due to clear indication of seniority based queue of faculty members of unequal merits and qualifications, could be made to bring in reforms of far reaching significance for the betterment of the system.

The author though joined the teaching profession in higher education at the age of about 26 years almost 4-5 years late as compared to average joining age in the profession that time, due to several obstructions in education beyond his control from the very beginning and the lobby system in the university further slowed down his career progress due to least inbuilt demand of the system for various interconnected other academic engagements and innovative contributions. Timely promotions do not only amount to be individual gains to the concerned faculty members but carrying forward the agenda of strengthening the outcome based academic enrichment for long term institutional contribution to the mankind. As per norms, a Lecturer is eligible for higher position of Reader/Associate Professor with five year experience, in exceptional cases even after three years and in most exceptional cases of visible contribution just direct appointment as Reader/Associate

through open competition. Some time back a scheme known as merit promotion scheme was introduced by UGC for one time promotion in life without any competition like open posts due to too much stagnation without availability of sanctioned positions in higher education but it discontinued for want of any positive impact in academics as expected. Hence all India competition for sanctioned positions only was the opportunity for promotion which is certainly good for building institutions of excellence. Just with the normal course of all yardsticks the author had become eligible for higher position of Reader/Associate Professor after five years of his service as Lecturer on February 13, 1986 and accordingly he had applied for the same as per the advertisement issued by the university. But Just out of the ongoing culture of cartelisation by the Lobby Members, none of the other local candidates appeared in the interview intentionally to give very clear message that any anti-status quo action of the university would destabilise the departmental atmosphere on account of hostility of non Ph D senior Lecturers. In fact this was the undeclared law on the campus in many departments that a junior would go ahead in the presence of their senior colleagues in the set (undeclared) queue only no matter even if they were ineligible, against the very basic spirit and purpose of the higher education. Of course for meaningfully regular contribution to mankind an institution must create and maintain conducive environment for all stakeholders which JU couldn't help despite its inception in the said form since 1969 due to strong lobby culture for maintaining just like this status quo. Despite being left alone, he appeared in the interview and did his best yet the post was not filled, apparently giving the impression that the author was the single candidate in the interview and thus without any competition post remained unfilled. It's natural too for the system not to be so adventurous to get ready for facing tough time from the Lobby if anything though meritorious but not acceptable to the culture of such undeclared law. However in many cases appointments had been made even with single candidate in the interview as either lobby was comfortable with it or selection happened in subsequent interview with single candidate even after a repeat advertisement. Thus it was taken very positively by the author that those who could not appear this time may appear next time, paving the way for better competition along with expectedly candidates from outside too. The author too made efforts as usual for meaningful paper presentations, extension and publications and accordingly applied again when the post was re-advertised in due course of time. Fortunately this time the selection committee recommended his name for selection as Reader in Commerce but before it could be approved finally by the top decision making body of the university the somebody having the blessings of the so called Lobby filed a representation presenting the case in typical language as if the post had been managed through unfair and fraudulent means. Such a situation would exist with anybody who would not tow the lines of those mater otherwise in the given lobby system which was not formal but very strong to build its interest only. In fact this post of Reader in Commerce had been advertised with specialisation in Marketing Management as sanctioned by UGC and his area of specialisation was challenged after the interview despite the fact that no such representation was ever filed before the interview held twice. So much so the author hardly found anybody in the university to defend his case on merit due to said culture of pressure politics. He also heard that his case of promotion was not planned to be taken up in the Agenda for the meeting of

University Council, the top decision making body of the university for final approval of the selections in senior positions. Having heard all this, he met the then Vice Chancellor late Prof Lakhman Paul and explained his position as how he was fully competent to be appointed as Reader in Commerce with specialisation in Marketing Management and requested for the copy of the said complaint as fair opportunity to explain in writing before any adverse decision if at all could be taken by the university. However despite his request when no such opportunity was given as a law of natural justice and the case appeared to be heading as per claims of the Lobby, he could meet the then Chief Minister Dr Farooq Abdullah, being Pro-Chancellor of JU, in his office chamber with prior appointment and explained this kind of torturous treatment to the genuine candidate. The Chief Minister gave patient hearing and asked his the then Principal Secretary to request the Vice Chancellor for presenting the case before University Council in its next meeting with full detail. Accordingly in response to certain queries in writing, the author presented his case of specialisation in Marketing Management with facts and the case was placed before one man Committee under late Prof Om Parkash, Former Vice Chancellor of Rajasthan University, Jaipur. All this then finally was approved by the University Council and he joined as Reader in Commerce on April 18, 1987. This explains enough as to how people were compelled to tow the lines of Lobby System and maintain such a status quo, though the author could save himself due to visible efforts in meeting these unethical job challenges.

Further the practice of Headship and Deanship by rotation in the University System was also of new origin in 1980s which invariably had brought more negativity instead of positive impact as planned, however practice continued due to country wide demand by the associations of the teachers in higher education. Selection of the author as Reader after aforesaid tug of war was seen as failure of the Lobby and all possible hurdles were created thereafter too to ensure that he would not be confirmed at the end of the probation period of one year. So much so all possible efforts were made to corner him by humiliating and harassing at every possible event even to the extent of building a case of insubordination and dereliction of duty with the intention to weaken his straightforwardness and approach of fair play in decision making in the system. Thus instead of recommending his confirmation as Reader in Commerce at the end of one year of probation, proposal for taking an action against him on various grounds was placed before the University Council. Since the case was built against him without any prior opportunity of being heard, a one man Committee was constituted under the Convenorship of late Prof. B. D. Sharma, Senior Most Professor of the University, for the detailed investigation. This led to delay in the confirmation of the author as Reader even after the successful completion of one year of probation, causing further tension, harassment and humiliation. After about 2-3 months the Committee expressed its inability to complete the investigation on the grounds of personal relationship and closeness of the people in both the sides of the case. Consequently the university constituted second Committee with another Senior Professor of the University, Prof. O. P. Kotwal and this Committee too exactly took the same position and expressed its inability to complete the investigation. With such administrative style of functioning and overall environment in the system people like the author do suffer a lot, however some of them with

clear vision and transparent achievements ultimately succeed too. Though the then Vice Chancellor was himself aware of the factual position yet kept on finding proper investigation of the case formally to justify for the action transparently but for want of speedy redressal mechanism people do suffer. Finally third Committee was appointed with the then Senior Most Professor late Dr. T. R. Sharma as its convenor which finally submitted the report leading to confirmation of the author as Reader in Commerce after the lapse of about a year, however with back effect from due date.

With the passage of time after about five years of more work the author appeared for the position of Professor of Management but exactly same happened as stated above in case of his promotion as Reader in Commerce and post could not be filled apparently with the impression that let other candidates in the faculty have another opportunity with more time for their much more contribution and preparation for senior positions. In fact after the interview next day late Dr D K Gupta, the then Registrar, personally visited the author in his office and expressed great satisfaction with regards to his (author's) performance before the selection committee and advised for more work in this regards. Just within few months the author could earn Fulbright Fellowship for ten months in USA. On return from USA the author became Professor of Commerce on May 30, 1994 through all India competition and worked on major positions in the university, served as Chairman, J&K Board of Professional Entrance Examination during 2012-14 on deputation basis and finally as Vice Chancellor of University of Jammu during October 2014 July 2018 and also Vice Chancellor, Noida International University, Greater Noida (UP) during September 2018- October 2019.

All this indicates the necessity of right kind of efforts from the very beginning on both professional enrichment and procedural formalities contributing academically to the overall development of mankind, no matter what hurdles come in. In given situation of limited resources for many claimants, tug of war is good sign for much better efforts with needed achievements and qualifications instead of countering negative forces exactly in the same negative way. Clarity about the system and commitment to the job despite all challenging circumstances ultimately result into targeted outcome of visible significance. In fact situation itself guides the nature and extent of efforts and commitments required without diluting moral, ethical and honest value system. It is in this context family structure, home grooming, educational environment, transparently objective methods of enrichment and socio-cultural engagements make the people quite well equipped to live a comfortable and meaningful life by facing all kinds of challenges and thus contributing back to the system for long term significance of far reaching significance. In fact such struggles only build the institutions for next generations.

Consolidation for effectiveness of Supply chain: A Case Study of Diamond Edge Tools, Varanasi

* Prince Kumar

The paper reviews emerging patterns in supply chain incorporation with focus on improving agility of the supply chain. It also explores the relationship between the emerging patterns and attainment of competitive objectives. Logistic management is a complex system that involves many system elements from various functional areas. Performance of a supply chain heavily depends on the effectiveness of integration of various suppliers into the organization and formulating appropriate strategies to improve the responsiveness. This paper focuses on the development of a systematic approach with the following objectives: (1) to enhance responsiveness of supply chain, (2) to use Analytic hierarchy process (AHP) which offers methodology to rank alternative courses of action based on the decision maker's judgment concerning the importance of the criteria and the extent to which they are met by each alternative. Key words: Agility, Supply chain, Analytic Hierarchy Process (AHP), supplier selection.

INTRODUCTION

To develop a model for integration of supply chain and improving responsiveness in order to respond to the uncertain market demand agility is the ability of an enterprise to respond to the rapidly changing markets, the idea of agility in the context of supply chain management focus around responsiveness. An effective supplier selection process is very important to the success of any manufacturing organization. In this context, supplier selection represents one of the most important functions to be performed by the purchasing department.

NIMBLE SUPPLY CHAIN

Agile supply chains are designed to react quickly to market demands by positioning inventories and capacities in order to hedge against uncertainties in demand irrespective of regional basis. Responsiveness is defined as the ability of a supply chain to respond rapidly to changes in demand, both in terms of volume and mix of products. Uncertainties in demand are unavoidable due to the changing market conditions and customer expectations. Specifically, the agile supply chain should possess the following characteristics.

METHODOLOGY

This model allows firms to work back from the objectives to the means for achieving them. The potential changes likely to affect the company are evaluated based on their importance to the current business, Analytic hierarchy process and weighted point method approaches are used

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determining strategy for responding to these changes, we identify the business practices and the organizational infrastructure necessary to support the creation of agile capabilities.

ANALYTIC HIERARCHY PROCESS

The AHP is relatively simple to use and understand. This method incorporates qualitative and quantitative criteria. AHP offers a methodology to rank alternative courses of action based on the decision maker's judgment concerning the importance of the criteria and the extent to which they are met by each alternative.

WEIGHTED POINT METHOD

Another method is the weighted point which considers attributes that are weighted by the buyer. The weight for each attribute is then multiplied by the performance score that is assigned. Finally, these products are totaled to determine a final rating for each supplier.

Identify key supplier evaluation categories; the primary criteria are cost/price, quality and delivery, which are generally the most obvious and most critical areas that affect the buyer. Weight each evaluation category; the total of each weight must equal 1.0. Identify and weight subcategories, the sum of the subcategory weight must equal the total weight of the performance category. Define scoring system for categories and subcategories, for illustrative purposes, an example is a 10 point scale, where 1-2=poor, 3-4=weak, 5-6=marginal, 7-8=qualified, 9-10=outstanding. Evaluate supplier directly, review evaluation results and makes selection decision; the primary output from this step is a recommendation about whether to accept a supplier for a business.

In both the methods criteria for supplier prioritizations are,

- Price
- Quality
- Delivery
- Service

The following tables presents a scale used for quantifying managerial judgments for AHP.

Analysis and weighted point method(WPM), for example, if a buyer believes that quality is moderately more important than delivery, then this judgment is represented by a 3. Judgments are required for all the criterion comparisons, and for all the alternative comparisons for each criterion. This information is usually provided by the buyer.

We have taken a case study of Diamond Edge Tools, Varansi, a firm which manufactures tools and machineries. We have obtained ratings from the Manager-procurements of different departments and presented the AHP and WPM analysis.

	Quality	Price	Service	Delivery
Quality	1.00	2.00	4.00	3.00
Price	0.45	1.00	3.00	3.00
Service	0.30	0.36	1.00	2.00
Delivery	0.34	0.30	0.50	1.00
Total	2.09	3.67	8.50	9.00

The data in the matrix can be used to generate a good estimate of the criteria weights. The weights provide a measure of the relative importance of each criterion.

This process is summarized in the following three steps and shown in the following Table

1. Sum the elements in each column.
2. Divide each value by its column sum.
3. Compute row averages.

	Quality	Price	Service	Delivery	Weights
Quality	0.52	0.57	0.49	0.32	0.46
Price	0.20	0.25	0.33	0.34	0.30
Service	0.10	0.08	0.11	0.20	0.14
Delivery	0.18	0.10	0.07	0.13	0.11
Total	1.00	1.00	1.00	1.00	1.00

Next, the four suppliers are compared pair wise for each criterion. This process is virtually identical to the procedure that was used to develop the criteria comparison matrix. The only difference is that there is a supplier comparison matrix for each criterion. Therefore, the decision maker compares each pair of suppliers with respect to the quality criterion

	Supplier 1	Supplier 2	Supplier 3	Supplier 4
Supplier 1	1.00	5.00	6.00	0.33
Supplier 2	0.20	1.00	2.00	0.17
Supplier 3	0.17	0.50	1.00	0.13
Supplier 4	3.00	6.00	8.00	1.00
Total	4.37	12.50	17.00	1.63

Now the summary of supplier matrix is calculated and the summary matrix is shown below.

Summary Matrix

	Supplier 1	Supplier 2	Supplier 3	Supplier 4	Weights
Supplier 1	0.24	0.40	0.35	0.21	0.30
Supplier 2	0.03	0.08	0.12	0.10	0.09
Supplier 3	0.05	0.04	0.06	0.08	0.05
Supplier 4	0.68	0.48	0.47	0.62	0.56
Total	1.00	1.00	1.00	1.00	1.00

By using the same procedure the summary matrix for price delivery and service are calculated and shown below.

Price Matrix

	Supplier 1	Supplier 2	Supplier 3	Supplier 4	Weights
Supplier 1	0.23	0.21	0.37	0.40	0.30
Supplier 2	0.69	0.63	0.52	0.45	0.57
Supplier 3	0.05	0.09	0.07	0.10	0.08
Supplier 4	0.03	0.07	0.04	0.05	0.05
Total	1.00	1.00	1.00	1.00	1.00

Delivery Matrix

	Supplier 1	Supplier 2	Supplier 3	Supplier 4	Weights
Supplier 1	0.14	0.20	0.13	0.14	0.15
Supplier 2	0.05	0.07	0.08	0.05	0.06
Supplier 3	0.68	0.53	0.66	0.68	0.64
Supplier 4	0.14	0.20	0.13	0.14	0.15
Total	1.00	1.00	1.00	1.00	1.00

Service Matrix

	Supplier 1	Supplier 2	Supplier 3	Supplier 4	Weights
Supplier 1	0.63	0.61	0.70	0.44	0.60
Supplier 2	0.13	0.12	0.09	0.22	0.14
Supplier 3	0.16	0.24	0.18	0.28	0.21
Supplier 4	0.08	0.03	0.04	0.06	0.05
Total	1.00	1.00	1.00	1.00	1.00

Hence by using the AHP approach, different competencies of the four suppliers are analyzed and they are prioritized for each of the parameters.

Now using weighted point method (WPM), the four parameters of the organization are analyzed and prioritized and the calculations of weights are explained below.

Criterion and sub criterion used for weighted point method.

- Quality
 1. Product quality
 2. Manufacturing quality
- Cost
 1. Direct cost
 2. Indirect cost
- Service
 1. Responsiveness
 2. Facility
- Delivery
 1. Due date
 2. Delivery quality

Weighted point matrix for quality sub criterion

	Quality	Product quality	Manufacturing quality
Quality	1	3	5
Product quality	1/3	1	2
Manufacturing quality	1/5	1/2	1

Summary of quality matrix

	Quality	Product quality	Manufacturing quality
Quality	1	3	5
Product quality	0.33	1	2
Manufacturing quality	0.2	0.5	1

Calculated weights for quality sub criterion

	Weight	Quality	Product quality	Manufacturing quality
Quality	0.64	0.66	0.66	0.62
Product quality	0.25	0.22	0.22	0.25
Manufacturing quality	0.12	0.13	0.11	0.12

Calculated weights for cost sub criterion

	Weight	Cost	Direct cost	Indirect cost
Cost	0.692	0.735	0.803	0.538
Direct cost	0.235	0.161	0.160	0.384
Indirect cost	0.071	0.102	0.035	0.076

Calculated weights for delivery sub criterion

	Weight	Delivery	Due date	Product quality at delivery
Delivery	0.589	0.602	0.666	0.5
Due date	0.25	0.198	0.222	0.33
Product quality at delivery	0.158	0.198	0.111	0.166

Calculated weights for services sub criterion

	Weight	Service	Responsiveness	Facility
Service	0.539	0.546	0.571	0.5
Responsiveness	0.296	0.273	0.285	0.33
Facility	0.162	0.180	0.142	0.166

Global weight for sub criterion

Criteria	Local weight	Sub-Criteria	Sub-Criteria Local weight	Global weight
Quality	0.64	Product quality	0.25	0.160
		Manufacturing quality	0.12	0.076
Cost	0.692	Direct cost	0.235	0.162
		Indirect cost	0.071	0.049
Delivery	0.589	Due date	0.25	0.147
		Product quality at delivery	0.15	0.088
Service	0.539	Responsiveness	0.296	0.159
		Facility	0.162	0.087

Now, we have prioritized the four parameters and weights are calculated based on the ratings. By combining the results of AHP and WPM method we are proposing the following strategy based on the priority of parameters.

Change response strategy

Sourcing criteria	Change response strategy	Sourcing condition
COST	SELECT SUPPLIER S2	When cost of the product is more important than quality and delivery and the company has more time to purchase.
QUALITY	SELECT SUPPLIER S4	The company focus on quality of the product and has more time for purchase and cost is not a concern.
DELIVERY	SELECT SUPPLIER S3	When the company needs the product immediately for manufacturing or assembly.
SERVICE	SELECT SUPPLIER S1	When the company is concerned about future requirements and maintenance cost.

CONCLUSION

The supplier selection processes are very important to organizations nowadays since choosing the one that fits best the company's needs, can bring significant savings. Manufacturers have over the years nurtured their smaller partners and tried to integrate them into a seamless supply chain. On the other hand in some cases, Buyers and suppliers do not trust each other and the relationships are generally cost based with little information sharing at the planning or strategy stage. Hence this work has tried to develop a model to create different Nimble strategies that will make the supply chain more responsive.

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Integration of Building Information Modelling with Virtual Reality

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ABSTRACT

The potential of **Building Information Modelling (BIM)** is to guide a transformation of the techniques of layout and construction has been obtrusive within the production enterprise. A current BIM subject matter that requires attention is the integration of BIM with Virtual Reality (VR), where the person visualizes a digital international through interactive gadgets or a total immersion. The use of Building Information Modeling (BIM)-based computer simulation tools is growing rapidly, and such tools assist designers in making better decisions to reduce energy consumption and to create better lighting conditions for occupants. A wild assertion has been made that augmented and virtual reality are the big things to hit all fields. VR/AR is not new entities on the block but they are the most 'popular'. Panoramic paintings in the 1800s were the first attempt at virtual reality aimed at surrounding the viewer making them feel present in an historic event. In 1838, the first stereoscope viewers were created. In the 1930s, science fiction writer, Stanley G. Weinbaum, described devices very similar to the modern day VR headsets. VR and AR have only picked up mainstream traction in recent years. VR combines numerous gadgets for interplay, developing digital surrounding and this must accompanied by way of research concerning a way to use devices or a way to set up hyperlinks for the presentation of statistics contained in a BIM version. By adding VR, the BIM solution can cope with retrieving and presenting data and growing performance on conversation and trouble solving in an interactive and collaborative venture. The text offers a review of actual perspective of the use of VR applied in 4D/BIM models.

Keywords: Building information modeling, Augmented reality, Virtual Reality, digital

Building Information Modelling

Building Information Modelling (BIM) is defined because the technique of generating, storing, dealing with, exchanging, and sharing constructing facts in an interoperable and reusable manner. BIM represents the process of improvement and use of a computer generated version to simulate the making plans, design, construction and operation of a facility. The ensuing product, a Building Information Model, is a facts-rich, shrewd and parametric digital illustration of the building task. So, BIM can be taken into consideration as a virtual illustration of a constructing, an object-oriented 3-dimensional (three-D) model, and a repository of challenge facts to facilitate interoperability and exchange of facts with associated software programs. Therefore, BIM

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statistics-rich model lets in perspectives and records, appropriate to various users' wishes, can be extracted and analysed to generate statistics that can be used to make selections and to improve the manner of handing over the ability.

BIM can generate and preserve information produced during the whole lifestyles cycle of a constructing task from layout to upkeep and may be implemented to diverse fields. Due to the consistency of layout records with first-class facts and production procedure with first-rate control method, the capacity of BIM implementation in satisfactory control lies in its ability to present multi-dimensional statistics which include design records and time series. BIM and its programs in undertaking management are taken into consideration ND/BIM models, particularly 3D/BIM version refers to all three-D constructing additives and it includes all of the constructing components, which include geometry, spatial relationships, properties and quantities 4D/BIM version worries the development system that can be visualized via building the three-D product version thru time according to the important course community (the version helps dynamic production web site safety control, coaching of schedules and estimates, monitoring and coping with modifications, and handling web page logistics) 5D/BIM model is related with expenses 6D/BIM model is created to aid control facilities and protection along the submit career lifecycle of the building the ND guidelines of BIM use must be primarily based in an ok dating between the crew members improving a higher collaborative venture, supported in an efficient interoperability of specific software.

A modern-day BIM subject matter that require nation of the artwork technology, is the combination of BIM with Augmented Reality (AR) combining the actual global with digital objects and with Virtual Reality (VR) in which the consumer visualize a virtual international that isn't always real (total immersion), through special glasses. This area is interrelated with different fields that may employ the visualization allowed by way of the BIM version, such as facilities management related with the visualization of information protected in a BIM version, in actual Permission to make virtual or tough copies of all or a part of this work for private or classroom use is granted without price provided that copies are not made or allotted for profit or business benefit and that copies bear this word and the total citation on the primary web page. Copyrights for components of these paintings owned by means of others than ACM must be honoured. Abstracting with credit is permitted.

To reproduction otherwise, or republish, to submit on servers or to redistribute to lists, calls for earlier particular permission and/or a rate. Request permissions from time following the interplay made possible through VR generation. BIM provides an opportunity to examine a model specifically for: constructability conflicts; ways to lessen strength usage; validating energy decreasing layout thoughts; or enhancing life safety. As such, it is expected to be in addition explored inside the close to future. The objective of this paper is to report the improvement of BIM uses with the addition of interactive capacities allowed by VR era. A bibliographic and software program research was made to guide the have a look at.

What is Smart City?

A **smart city** is a technologically modern urban area that uses different types of electronic methods, voice activation methods and sensors to collect specific data. Information gained from that data is used to manage assets, resources and services efficiently; in return, that data is used to improve operations across the city. This includes data collected from citizens, devices, buildings and assets that is processed and analyzed to monitor and manage traffic and transportation systems, power plants, utilities, water supply networks, waste, crime detection,^[1] information systems, schools, libraries, hospitals, and other community services. Smart cities are defined as smart both in the ways in which their governments harness technology as well as in how they monitor, analyse, plan, and govern the city. The smart city concept integrates information and communication technology ('ICT'), and various physical devices connected to the Internet of things ('IoT') network to optimize the efficiency of city operations and services and connect to citizens. Smart city technology allows city officials to interact directly with both community and city infrastructure and to monitor what is happening in the city and how the city is evolving. ICT is used to enhance quality, performance and interactivity of urban services, to reduce costs and resource consumption and to increase contact between citizens and government. Smart city applications are developed to manage urban flows and allow for real-time responses. A smart city may therefore be more prepared to respond to challenges than one with a conventional "transactional" relationship with its citizens. Yet, the term itself remains unclear in its specifics and therefore, open to many interpretations.

What Is AR?

Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory. AR can be defined as a system that incorporates three basic features: a combination of real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and real objects. The overlaid sensory information can be constructive (i.e. additive to the natural environment), or destructive (i.e. masking of the natural environment). This experience is seamlessly interwoven with the physical world such that it is perceived as an immersive aspect of the real environment. In this way, augmented reality alters one's ongoing perception of a real-world environment, whereas virtual reality completely replaces the user's real-world environment with a simulated one. Augmented reality is related to two largely synonymous terms: mixed reality and computer-mediated reality.

The primary value of augmented reality is the manner in which components of the digital world blend into a person's perception of the real world, not as a simple display of data, but through the integration of immersive sensations, which are perceived as natural parts of an environment. The earliest functional AR systems that provided immersive mixed reality experiences for users were invented in the early 1990s, starting with the Virtual Fixtures system developed at the U.S. Air Force's Armstrong Laboratory in 1992. Commercial augmented reality experiences were first introduced in entertainment and gaming businesses. Subsequently, augmented reality

applications have spanned commercial industries such as education, communications, medicine, and entertainment. In education, content may be accessed by scanning or viewing an image with a mobile device or by using markerless AR techniques.

Uses of AR

Augmented reality is used to enhance natural environments or situations and offer perceptually enriched experiences. With the help of advanced AR technologies (e.g. adding computer vision, incorporating AR cameras into smartphone applications and object recognition) the information about the surrounding real world of the user becomes interactive and digitally manipulated. Information about the environment and its objects is overlaid on the real world. This information can be virtual. Augmented Reality is any experience which is artificial and which adds to the already existing reality. or real, e.g. seeing other real sensed or measured information such as electromagnetic radio waves overlaid in exact alignment with where they actually are in space. Augmented reality also has a lot of potential in the gathering and sharing of tacit knowledge. Augmentation techniques are typically performed in real time and in semantic contexts with environmental elements. Immersive perceptual information is sometimes combined with supplemental information like scores over a live video feed of a sporting event. This combines the benefits of both augmented reality technology and heads up display technology (HUD).

What is VR?

Virtual reality (VR) is a simulated experience that can be similar to or completely different from the real world. Applications of virtual reality include entertainment (particularly video games), education (such as medical or military training) and business (such as virtual meetings). Other distinct types of VR-style technology include augmented reality and mixed reality, sometimes referred to as extended reality or XR.

Currently, standard virtual reality systems use either virtual reality headsets or multi-projected environments to generate realistic images, sounds and other sensations that simulate a user's physical presence in a virtual environment. A person using virtual reality equipment is able to look around the artificial world, move around in it, and interact with virtual features or items. The effect is commonly created by VR headsets consisting of a head-mounted display with a small screen in front of the eyes, but can also be created through specially designed rooms with multiple large screens. Virtual reality typically incorporates auditory and video feedback, but may also allow other types of sensory and force feedback through haptic technology

Comparison of augmented reality with virtual reality

In virtual reality (VR), the users' perception of reality is completely based on virtual information. In augmented reality (AR) the user is provided with additional computer generated information within the data collected from real life that enhances their perception of reality. For example, in architecture, VR can be used to create a walk-through simulation of the inside of a new building; and AR can be used to show a building's structures and systems super-imposed on a real-life view. Another example is through the use of utility applications. Some AR applications, such as Augment, enable users to apply digital objects into real environments, allowing businesses to use augmented reality devices as a way to preview their products in the real world. Similarly, it can also

be used to demo what products may look like in an environment for customers, as demonstrated by companies such as Mountain Equipment Co-op or Lowe's who use augmented reality to allow customers to preview what their products might look like at home through the use of 3D models.

Augmented reality (AR) differs from virtual reality (VR) in the sense that in AR part of the surrounding environment is 'real' and just adding layers of virtual objects to the real environment. On the other hand, in VR the surrounding environment is completely virtual and computer generated. A demonstration of how AR layers objects onto the real world can be seen with augmented reality games. WallaMe is an augmented reality game application that allows users to hide messages in real environments, utilizing geolocation technology in order to enable users to hide messages wherever they may wish in the world. Such applications have many uses in the world, including in activism and artistic expression.

Architecture of augmented reality

AR can aid in visualizing building projects. Computer-generated images of a structure can be superimposed onto a real-life local view of a property before the physical building is constructed there; this was demonstrated publicly by Trimble Navigation in 2004. AR can also be employed within an architect's workspace, rendering animated 3D visualizations of their 2D drawings. Architecture sight-seeing can be enhanced with AR applications, allowing users viewing a building's exterior to virtually see through its walls, viewing its interior objects and layout.

With continual improvements to GPS accuracy, businesses are able to use augmented reality to visualize georeferenced models of construction sites, underground structures, cables and pipes using mobile devices. Augmented reality is applied to present new projects, to solve on-site construction challenges, and to enhance promotional materials. Examples include the Daqri Smart Helmet, an Android-powered hard hat used to create augmented reality for the industrial worker, including visual instructions, real-time alerts, and 3D mapping.

Following the Christchurch earthquake, the University of Canterbury released CityViewAR, which enabled city planners and engineers to visualize buildings that had been destroyed. This not only provided planners with tools to reference the previous cityscape, but it also served as a reminder of the magnitude of the resulting devastation, as entire buildings had been demolished.

Urban design and planning of AR

AR systems are being used as collaborative tools for design and planning in the built environment. For example, AR can be used to create augmented reality maps, buildings and data feeds projected onto tabletops for collaborative viewing by built environment professionals. Outdoor AR promises that designs and plans can be superimposed on the real-world, redefining the remit of these professions to bring in-situ design into their process. Design options can be articulated on site, and appear closer to reality than traditional desktop mechanisms such as 2D maps and 3d models.

Review of Literature

A successful project delivery using building information modelling (BIM) technologies relies on effective collaboration and Virtual reality (VR) is a completely new area in the cyber world, hence future work must be focused on fully realising its possibilities and opportunities. [1]. With the right technology and internet access, desktop sharing software can be a viable and even cost-effective

alternative to standard BIM servers for team collaboration[2] The full potential of BIM for empowering VR has yet to be realised, which could be due to several technological and management constraints that BIM must overcome. Communication and collaboration between the design, building, operation, and maintenance phases is one of these hurdles. VR can bridge this gap by giving extra BIM features that were previously unavailable or impossible to use in a realistic way[3] The BIM technology not only has given more but it also assured an up-to-date, accurate, and clearly understood data.[4]. Virtual reality (VR), is a tool that allows a user to interact with a computer-generated simulation of a real or imagined environment[5]. Building Information Modeling (BIM) is being more widely used in the AEC/FM business, which is changing how safety is treated. It accomplishes this by recognising and eliminating threats automatically. It is predicated on the understanding that the construction site changes everyday as a result of the building model and accompanying timetable, with new safety hazards appearing (and others being removed) as the project develops. Building Information Models (BIM)2 have gained popularity in the construction industry in recent decades as a result of numerous benefits and resource savings throughout the design, planning, and construction of new structures.[7] AR should be omnipresent (including context awareness) and work in conjunction with tracking and sensing technologies like RFID, laser pointing, sensors, and motion tracking[8]. The growing usage of BIM technology is causing significant changes in corporate operations and project management techniques. New roles and connections among project stakeholders, as well as multiple project delivery systems (e.g., IPD, IPD-ish, and IPD-lite), are continually evolving as the technical side of BIM improves. Because of their potential in coordinating and controlling overall project information and processes, as well as harmonising organisational strategies within a complex project environment, the managerial aspects of BIM have gotten a lot of interest from both the construction industry and academia[9] Traditional management and monitoring systems are currently unable to keep up with the industry's rapid growth, resulting in a number of issues with job efficiency and information transmission across project delivery phases. As a result, the Architecture Engineering Construction and Operations sector is aiming to improve project management, support trade crews, and create a more efficient working environment through digitization. As a result, BIM adoption reflects a paradigm change away from old methodologies and toward a collaborative and integrated working process[10]. Easy-entry technologies like Virtual Reality tools are established themselves as a prospective addition to BIM methodology to help with deployment and implementation[10]. BIM (Building Information Modeling), VR (Virtual Reality), AR (Augmented Reality), and MR (Mixed Reality) are techniques that have been extensively researched to address traditional challenges such as the inability to cope with large amounts of project data, safety concerns, and numerous uncertainties[11] Despite their backgrounds, user participants enthusiastically embrace the concepts and goals of sustainability, and there is some evidence that respondents prefer the economy to sustainability. Similarly, rather than focusing on the building's economic elements, the participants are not attempting to measure the emissions of their design ideas[12]. Through processing and automatic absorption of information, augmented reality (AR) emerges to improve BIM in terms of visualisation of the construction site[13]. Building Information Modeling (BIM), the Internet of Things (IoT), and Virtual Reality (VR) provide synergistic benefits for designing an immersive VR application for real-time thermal

comfort monitoring[14]. Augmented reality (AR) and virtual reality (VR), two state-of-the-art technologies for superimposing information onto the real world, have just lately begun to impact our daily lives. Furthermore, in recent years, AR and VR have made a significant contribution to enhanced construction management. However, in the literature, there is no complete critical analysis of AR and VR technologies in construction management[15] the potential of VR technology for intelligent information processing in AEC/FM projects will not be fully realised without an effective strategy to synchronise design data in VR environments[16] The possibility for BIM and higher-quality VR tools, such as Matterport, to work together must be investigated. Real-life imagery will be possible, eliminating the need for generic families to portray soft goods like desks or custom furniture[17]

Applications of VR

Virtual reality is most commonly used in entertainment applications such as video games, 3D cinema, dark rides and social virtual worlds. Consumer virtual reality headsets were first released by video game companies in the early-mid 1990s. Beginning in the 2010s, next-generation commercial tethered headsets were released by Oculus (Rift), HTC (Vive) and Sony (PlayStation VR), setting off a new wave of application development. 3D cinema has been used for sporting events, pornography, fine art, music videos and short films. Since 2015, roller coasters and theme parks have incorporated virtual reality to match visual effects with haptic feedback.

Numbers of simulation tools compatible with BIM have been widely used in visualizing, identifying, and examining performance of indoor lighting and also simulating lighting energy consumption. Conventional simulated outputs often comprise quantitative and qualitative data, and the visualization features are based primarily on static two-dimensional (2D) images. Energy consumption outputs are usually generated as numerical data and presented as complex graphs, documents, and/or tables (18) which are separate from the visual context of the building (18). Such numerical data are used by experts who are experienced in interpreting such data. However, this creates a barrier for collaboration between design teams and clients who are not familiar with interpreting numerical results, and this prevents the parties from understanding the energy requirements of different design options.

In social sciences and psychology, virtual reality offers a cost-effective tool to study and replicate interactions in a controlled environment. It can be used as a form of therapeutic intervention. For instance, there is the case of the virtual reality exposure therapy (VRET), a form of exposure therapy for treating anxiety disorders such as post-traumatic stress disorder (PTSD) and phobias.

Virtual reality programs are being used in the rehabilitation processes with elderly individuals that have been diagnosed with Alzheimer's disease. This gives these elderly patients the opportunity to simulate real experiences that they would not otherwise be able to experience due to their current state. 17 recent studies with randomized controlled trials have shown that virtual reality applications are effective in treating cognitive deficits with neurological diagnoses. Loss of mobility in elderly patients can lead to a sense of loneliness and depression. Virtual reality is able to assist in making aging in place a lifeline to an outside world that they cannot easily navigate. Virtual reality allows exposure therapy to take place in a safe environment.

In medicine, simulated VR surgical environments were first developed in the 1990. Under the supervision of experts, VR can provide effective and repeatable training at a low cost, allowing trainees to recognize and amend errors as they occur. AR/VR can enhance smart cities, emergency management, and defence programmes. Disaster preparedness, real-time information overlay, and personnel training are some of the application areas in the public sector

Virtual reality has been used in physical rehabilitation since the 2000s. Despite numerous studies conducted, good quality evidence of its efficacy compared to other rehabilitation methods without sophisticated and expensive equipment is lacking for the treatment of Parkinson's disease. A 2018 review on the effectiveness of mirror therapy by virtual reality and robotics for any type of pathology concluded in a similar way. Another study was conducted that showed the potential for VR to promote mimicry and revealed the difference between neurotypical and autism spectrum disorder individuals in their response to a two-dimensional avatar.

Immersive virtual reality technology with myoelectric and motion tracking control may represent a possible therapy option for treatment-resistant phantom limb pain. Pain scale measurements were taken into account and an interactive 3-D kitchen environment was developed based on the principles of mirror therapy to allow for control of virtual hands while wearing a motion-tracked VR headset. A systematic search in Pubmed and Embase was performed to determine results that were pooled in two meta-analysis. Meta-analysis showed a significant result in favor of VRT for balance.

In the fast-paced and globalised business world meetings in VR are used to create an environment in which interactions with other people (e.g. colleagues, customers, partners) can feel more natural than a phone call or video chat. In the customisable meeting rooms all parties can join using the VR headset and interact as if they are in the same physical room. Presentations, videos or 3D models (of e.g. products or prototypes) can be uploaded and interacted with.

4D CAD Models

These are the models that combines physical 3D factors with time, were used to visualise construction process in several projects worldwide. 4D models had been used during the construction phase and were shown to have blessings over procedures that span the complete lifecycle of a task which includes collaboration with stakeholders, making layout choices, assessing undertaking constructability, figuring out spatial conflicts in production.

Concerning the introduction of 4D programs, as a support to comply with construction planning, numerous research can be found, linking VR technology to 3-D geometric models and reports related with the era of 4D/BIM fashions without the addition of VR.

Sampaio implemented a prototype primarily based on VR technology applied on production making plans. The geometrical AutoCAD 3-D model of best steps of the development pastime is related to the development planning time table, defining a 4D version. VR era allows the visualization of various tiers of the construction, and the interplay with the construction pastime, ensuing in a valuable asset in tracking the improvement of the development interest. The prototype makes use of MS Project AutoCAD and EON Studio software.

The 4D/VR application

This application actually shows the constructive manner, heading off inaccuracies and constructing mistakes, and so improving the communication between partners in the construction procedure.

Sampaio and Mota(20) created a 4D/BIM model the usage of Autodesk software (Revit and Navisworks) and MS Project. The 4D version permits the addition of time institutions to the 3-D factors, grouped in units associated with every mission, allowing the visualizations and analysis of the pastime series for the creation. The Navisworks software program allowed the interconnections amongst the 3-d fashions created in the making plans wherein this answer built the interconnection of 3-D models with making plans in MS Project. The ability to navigate through the version allows analysing each nook and each vicinity of the version. Navisworks additionally has the ability to provide guide in the analysis and detection of conflicts among the area of expertise projects.

4-D/VR/BIM MODEL

Recent trends in digital fact have encouraged the usage of interactive architectural visualization within the design, construction and facility control of constructing BIM projects locate that the interpersonal interaction in the VR surroundings is extra vital to the effective communication in a building undertaking, because it creates a shared immersive revel in, and evolved a BIM-enabled VR environment to understand multiplayer walkthrough in digital buildings. The multiplayer digital walk lets in actual time interactions of remotely positioned project stakeholders in the identical surroundings, with a shared immersive walkthrough revel in CAVE-like systems had been advanced for immersive VR experience as they music person's head and manage wand usually with 6 tiers of freedom, to navigate inside the digital surroundings and interact with the contents. Due to its immersive revel in and intuitive manipulation capability, it quickly won recognition in both studies and industry community.

CONCLUSIONS

BIM methodology considers the representation of the building as a virtual BIM model and its main concept is to assemble and centralize all the relevant information generated during development of the project. Structural design involves a set of tasks such as structure definition, analyses and after the generation of drawings and technical documentation. In all processes, it is required confidence in data transferred between the BIM systems used, and to support this, a high level of interoperability is claimed. For architects and designers, combination of VR and BIM permit them to higher talk layout purpose. An undertaking for architects is that of speaking standards and visions for buildings. The gain to using VR is within the communication of thoughts, principle and the vision for their buildings.

This permits all of the parties to extra quick reach a full appreciation of the building plan. When everybody shares not unusual information of the layout, the project is finished extra efficiently

from the outset. This cutting-edge BIM with VR topic require dissemination; application in actual cases and mentioned, in reports, achievements and problem; following the technologic advances that helps the BIM use and the visualization of records, in real time at the same time as the interacting with the Version made viable by means of VR Era. BIM+VR offer a possibility to investigate and discover BIM fashions within digital environments.

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Role of Mobile library in Globalization Era: A Descriptive Study

* **Rajiv Ranjan Mishra**

Abstract

This paper deals with the application and uses of mobile library in new trend. It's all about collaboration of ICT with technology. This paper also details use of mobile library in libraries and services offered to patron through the use of mobile libraries. This research influences the library users to better advancement of mobile libraries services. Library services and mobility, which both disquiet institutional mobile Libraries and non-institutional mobile libraries. Mobile libraries were originally seen as a way of offering a library service to those groups who would not otherwise receive one, but nowadays many mobiles offer all the facilities of a modern branch library. The groups of such libraries are considered, together with the services provided and the management decision.

Introduction :

In the present era both library and technology are growing organism. The role of ICT changes the environment and in development of library services. So, we say that with the help of ICT in library system creation, storing, and dissemination of information is developed and changed significantly. The changing needs of users force to libraries to rethink and reorganized in a well manner form of library sources and services. The web access required for digitization of library collection and provide wide access to their users. Presently new technology adopts by libraries to functioning the services such as RFID, Barcode, OPAC and mobile technology to cope with user's needs.

The Mobile Technology provide instant sharing of information and communication. Mobile has great features (advanced), which access all the information to the users in a search. The mobile services have capabilities then even before such as video streaming, synchronize mail, video messaging, chat, network connectivity, Wi-Fi etc. The interest of people shifting towards mobile technology because it is chip, handy, easily data handling. The librarian and LIS Professionals need to know the use of these technology changes and adopt it to stay connected with users instantly. Mobile phone libraries are easy to carry and flexible make students can use for prompt reference and conducting a research extensive. Mobile technology will help both novice and experienced librarians to stay relevant in a developing mobile society. The importance of library services in specific has been confirmed in international comparative surveys that rank the educational accomplishment of countries according to various indicators such as test scores, teacher qualifications, completion rates, etc. Mobile devices and services offer tremendous flexibility for those who want to take advantage of library services.

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Literature Review

A literature review is a broad summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. The review should enumerate, describe, summarize, objectively evaluate and clarify this previous research. It should give a theoretical base for the research and help you (the author) determine the nature of your research. The literature review acknowledges the work of previous researchers, and in so doing, assures the reader that your work has been well conceived. It is assumed that by mentioning a previous work in the field of study, that the author has read, evaluated, and assimilated that work into the work at hand.

According to Padhy, S. evaluated the development and appearance of mobile technology in libraries is a real time interaction with services. It identifies the new mission for constructing high quality mobile library services and discusses the future of mobile library architecture. Mobile technology has the impending to offer many new possibilities for accessing information from online catalogues, databases, digital content, e-learning, digital library, etc. The growth and solicitation of new mobile technologies has brought about many changes and possibilities and encourages users to increase utilization of the new mobile library. Ward, D. M. detailed that extensive literature review, the author defines the antiquity and problems of mobile library programs on that continent. In the future, their role should include collaboration with other agencies to deliver information to the majority of the population which rests rural and non-literate. The author also suggests that the term “mobile information delivery systems” would be more appropriate than “mobile libraries”. Bikos, G. discuss the phenomenon of mobile libraries with special reference to the Greek context. It's an overview of the history of mobile libraries internationally. Then we proceed to our case study presenting new data on the profile of the majority of mobile libraries' users and on the operation mode of such a particular case of libraries in Greece. By way of conclusion we reflect on their current state given that an explanation for the reasons which have led to the decline of inventions. Niemand, M., & Dlamini provided to remote schools by one provincial department of education is a successful initiative to improve library service as well as literacy levels and a reading culture. An overview of the role of the mobile library service and other related programs is the effort of this paper. Bell, R. represents data from an exploratory research project focused on how mobile libraries services with great extant. The findings show that the mobile librarians provide a variety of digital inclusion services, predominantly access to technologies and skills development and, by so doing, contribute positively to digital presence in non-urban areas of Aotearoa New Zealand. Fernandez, P. discovers mobile hotspots that allow library patrons to “check out” the Internet to access a world of information, as well as the related technologies on the horizon that are poised to transform Internet access worldwide. Innovative libraries and vendors are catching up to the implications of “mobile” beyond the Web interface and are making their collections and technological offerings available using re-envisioned bookmobiles, servers and library circulation module.

Mobile Technology

Mobile technology is defined as “Two-way communication devices, computing devices and

network technology to connect user with technology “. The technology enables mobile devices to share information, voice, data, and applications. The exploring of mobile technology is a way to connect with patrons/users in libraries and allow patrons to access library account, search database in easy and quick flow. Mobile technology provides a tool for delivering library services.

Importance

- To encourage librarian and library users, LIS professionals, para professionals to use mobile phones for library operation and cooperation.
- Mobile technology makes a greater impact on research work flow then researchers easily resolve their queries.
- Examine of benefits outcome is done by use of mobile technology.
- Mobile technology easy to identify the services that could delivered through mobile phones.
- Mobile technology regarding library services discloses the obstacles in providing information and service through the use of mobile phones.

Mobile Technology in Libraries

Mobile technology has rapidly increase due to increase of information technology. It also grew with use in the libraries and provide web content in most appropriate and effective way to the users. The multi searching features by mobile technology support to information needs of their users. Mobile technology created devices which have complex software use with cloud service (end user service), rich multimedia content and allow advance users to interactivity.

The mobile technology work on wireless network and adopt new hardware and technology such as Bluetooth, multimediascreen, Wi-fi, media creation and capture tools etc. Most of technologies given by the mobile industry like PDAs, iPod, UMPCs (ultra-mobile PC) without required of web results and mobilizing library contents in portable form suitable to small screen. Librarian and LIS Professionals prepared to take challenges and increase the access of their service anywhere, any time to one's own handhold phone or devices.

Mobile Library Services to Patron/Users

- **Database Browsing**
Libraries offer access to a variety of its resources and databases. The users can just enter search terms and see results that are configured specifically for mobile viewing. This service contains OPAC (online public access catalogue), cohesive search, and original document search. OCLC's WorldCat Mobile application pilot permits users to search and find books and other materials accessible in their local libraries through a web application they can access from a PDA or a smart phone.
- **Mobile document supply**
The mobile environment and technology present-day new chances for sending document requests and scanned images and monitoring the use of collections as well as the automation of organizational operations. It can provision electronic funds transfer, supply chain management, e-marketing, online marketing, online transaction processing, electronic data interchange, and automated inventory management systems.

➤ **E-learning**

Mobile devices to support distance learning, formal education, and research activities in e-learning atmosphere by creation of the information resources global. Students are very versatile in their mobile phones to easy installed applications to serve the services which they highly needed.

➤ **SMS notification**

Libraries provide to their users and patrons easy accessibility of library services with the use of mobile phone through SMS alerting on their interface. The users can get notified promptly with notice alerts such as- alerts on borrowing new books to the notice of users for suggestion, intimation of arrival of indented documents by users, informing availability of reserved documents for collection, appraising about overdue books, outstanding fines, reminders to return library items, renew books, library circulars, e-journals subscribed, loan request etc.

➤ **QR code Service on Mobiles**

Users merely enter the data to be translated, and the originator produces the code, which can then be displayed electronically or in printed format. Decoding the information can be done with any mobile camera phone that has a QR reader, and easily get the information in that QR code and fulfilled with their needs.

➤ **Mobile Interfaces with e-resources**

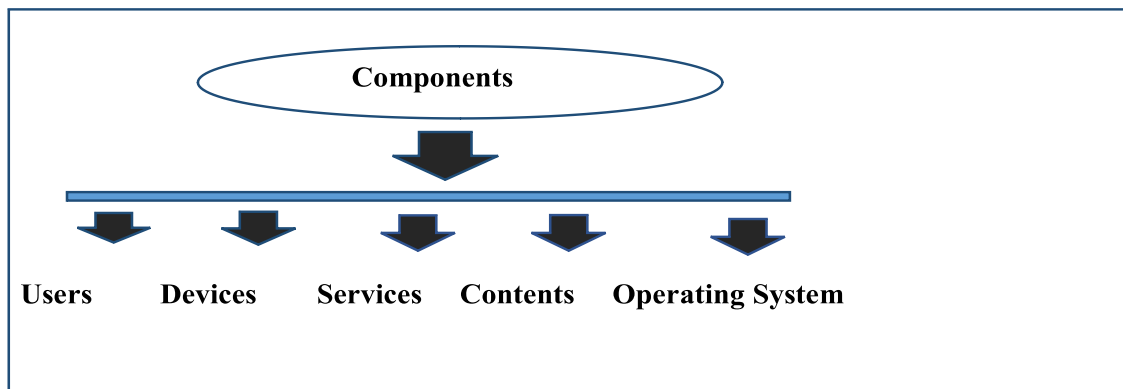
A large gathering of audio books both free-and subscription-based services are available for download and also transferable to mobile devices. Libraries can make use of multimedia messaging service (MMS) on mobile devices to share photos, videos, and audio. E-book publishers provide 24x7 access to the library subscriptions from any internet terminal on mobile devices.

➤ **Library guide**

Libraries can give users best services such as library guide, question answering service, and library statistics delivering rich content in a way that works best for users. Library provides fast response via the mobile device and find the appropriate information needed if users have query regarding source and services.

Mobile Devices used in Libraries

- ❖ PDAs (Personal Digital Assistant)
- ❖ Smart Phones
- ❖ Cell Phones
- ❖ iPods
- ❖ MP3 players
- ❖ Tablets



Prerequisites for Mobile-Based Library Services

Mobile technology can access all service with the integration of digital technology. The prerequisites for implementation of library services were as

- ❖ Digitized information base
- ❖ Information products designed for an e-platform
- ❖ Electronic information service delivery
- ❖ Design of electronic access systems

Advantages of Mobile Library Services

- User-friendly
- Personalised Service
- Ability to Access Information
- Time Saving
- User Participation
- Location Awareness
- Allow users to set preferences
- Compatibility
- Keep vital information at hand
- Speed, Convenience, Portability
- Load content faster
- Bring your own device

Challenges

Content For Mobile Service

Present mobile devices are limited by the speed to access internet connection, small screens, slow processing and limited storage capabilities. One of the most important barriers is the limited memory of mobile devices. An important factor of a successful Mobile library is how technology or the medium affects the information displayed, defining what amount and what type of information is appropriate.

Design of the interface

The formation of contents is suitable for a desktop computer may not be suitable for a mobile

device because of the limitation of a small screen size. Content for mobile display should be in smaller segments and information needs to be re-organized.

Separation of content -

The successful mobile library is that which should work for a broad range of devices, should be device independent. This object may be resolved through efforts to broaden the capabilities and flexibility of web browsers which separate the content from the format.

Handling of Pdf and multimedia files -

The most mobile library has links to learning resources in Adobe PDF format. But some devices not access this pdf. To avoid this problem, documents widely used in the mobile library site are re-organized into HTML for viewing.

Conclusion

There is a rising effect of mobile technology in Libraries, by network access becomes more affordable and reliable, and mobile applications have seen mainstream acceptance in teaching, learning, and research. This inclination will likely continue, and one-way libraries can re-join to this emerging trend is to make the library's services easily accessible via web-enabled mobile devices. Libraries should make cognizant choices about what they want to offer in this arena and act accordingly, and only time will tell if a completely mobile-accessible library, in terms of its services and collections, will become common place.

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An Analysis of Corporate Earnings in Selected Public Sector Companies in India: Determinants and Problem

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Abstract:

'Profits', 'Income', and 'Earnings' are now considered synonymous terms in accounting. Formerly, the accountants used to prepare a 'Profit and loss statement' and the net result was called 'Net profit' or 'Net loss'. The same statement is now called the 'Income statement' ending with the term 'Net income'.

This profitability measurement called the 'Income statement' or 'Earnings statement', is the basis for a variety of decisions relating to a business concern. Detailed knowledge of past performance is essential to evaluate the investment worth, management success, and creditworthiness of an enterprise.

The present study is a work focusing on problems and determinants of corporate earnings of public sector companies in India.

Keywords: Revenue, Expenses, Depreciation, Profit after Tax

Introduction:

Profits are one of the principal means of economic growth. Profit determines investment, and Investment is essential to growth. Today, much greater investment in plants and equipment is needed. To create more jobs for the constantly increasing labour force, what is needed is the expansion of the capacity to produce and the capacity to consume. All this requires business investment-investment in R &D. new plants, new equipment, new processes, and new products. Innovations involve high costs and high risks. A higher general level of investment profits is a must for all this, though the determining factor in the decision of investment in concern is not the record of past profits but the company's prospects for future profits, yet the knowledge of past profits is essential to estimate the future profit-making potential.

This profitability measurement called the 'Income statement' or 'Earnings statement', is the basis for a variety of decisions relating to a business concern. Detailed knowledge of past performance is essential to evaluate the investment worth, management success, and creditworthiness of an enterprise. Owners need some yardstick to measure the value of their enterprise; prospective shareholders to decide whether to invest in the concern or not; management to evaluate its past performance and plan their future activities; creditors to know the credit-worthiness of the enterprise; and, lastly, labour and management a guide for negotiations. All these groups place their

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main reliance upon the data disclosed in the income or earning statements. The reasons for and the extent of progress of the concern along with the amount and trend of profits are taken into consideration for rational decision-making.

Unfortunately, there is no general agreement about the term 'Corporate earning', the concept of 'Earnings' has different meanings in different spheres of economics, accounting, legal, etc.

Research Methodology

In this study, an attempt has been made to identify the key determinants of earnings of Public Sector companies in India.

Objectives:

- To measure the earnings of public sector companies.
- To identify the factors affecting the profitability of public sector companies.
- To compare the performance of the selected public sector companies as regards their profitability and related factors.

Data Collection

Five leading Public Sector Companies in India have been selected for this study. The period of study comprises 10 years i.e., from 2012 to 2021.

1. ONGC
2. PowerGrid
3. SAIL
4. BHEL
5. GAIL

The secondary data obtained from the Annual reports of the selected companies for the period under study form the main data source.

The hypothesis of the study:

1. H_0 There is no significant difference between earnings and Revenue of the company
2. H_0 There is no significant difference between earnings and Operating Expenses of the company
3. H_0 There is no significant difference between earnings and Financial Cost of the company
4. H_0 There is no significant difference between earnings and Depreciation of the company

Variables are taken in the study:

The following variables have been selected which are affecting the profitability of the public sector companies:

1. Revenue- **X1**
2. Expenses - **X2**
3. Financing Cost - **X3**
4. Depreciation - **X4**
5. EPS **Y**

Heading (Analysis and Interpretation)

Revenue of Selected Public Sector Companies: (X1)

The total revenue of various PSUs is examined in Exhibit 1. The study period encompasses the years 2019-20 and 2020-21 when the covid-19 pandemic struck. It may be seen in the results of all the companies. The revenue of all companies fell in the last two years of the research.

ONGC generated the most revenue during the study period, i.e. ₹90593.07 crores on average, compared to the other selected companies. In the year 2021, the ONGC earned the lowest income of ₹75283.60 crores while in the year 2019 the maximum income was ₹117173.56 crores.

YEAR/PSU	ONGC	POWERGRID	SAIL	BHEL	GAIL
2012	80968.07	10785.01	47964.77	49244.44	40829.83

PowerGrid had the lowest revenue on average throughout the study period. The explanation for this could be that PowerGrid is a newer company than the others. However, PowerGrid's revenue has increased during the study period, indicating that it is more efficient than other corporations.

YEAR/PSU	ONGC	POWERGRID	SAIL	BHEL	GAIL
2012	80968.07	10785.01	47964.77	49244.44	40829.83
2013	88442.08	13328.74	45562.70	49546.36	48287.20
2014	90603.47	15721.41	47579.82	40724.86	58406.45
2015	88237.53	17780.04	46731.56	31403.43	57602.84
2016	84560.24	21281.18	39666.84	27080.07	52771.85
2017	85455.86	26581.46	50302.71	30471.08	50059.26
2018	92887.65	30766.32	59446.81	29754.03	54812.49
2019	117173.56	35618.07	67500.13	31026.59	76671.57
2020	102318.64	38317.97	62645.77	22066.64	73293.19
2021	75283.60	40527.11	70121.71	17678.28	58742.25
Average	90593.07	25070.73	53752.28	32899.58	57147.69

Source: Data extracted from Annual Reports of the companies from 2012 to 2021

PowerGrid is the only company from the identified PSUs that has seen a consistent revenue increase over the research period. In comparison to other companies, BHEL's revenue has been dropping during the research period. BHEL's revenue decreased to ₹17678.28 crores in 2021 from ₹49244.44 crores in 2012. SAIL, on the other hand, has had a better gain in revenue, which has increased to ₹70121.71 crores from ₹47964.77 crores at the start of the research period. GAIL's revenue increased until 2019, after which it rapidly decreased in the last two years of the study period. The revenue of PowerGrid grew at a faster rate than that of other enterprises, but BHEL's performance was not adequate in this regard. The table shows that the Power sector has grown more rapidly than others.

Expenses of Selected Public Sector Companies:

Total expenses are studied in Table 2. A cost that is "paid" or "remitted" in exchange for something of value is referred to as an expense.

Table 2: Expenses of Selected Public Sector Companies

YEAR/PSU	ONGC	POWERGRID	SAIL	BHEL	GAIL
2012	47466.05	6168.75	42541.34	38922.93	35489.82
2013	57897.74	7708.58	42134.25	40113.48	42229.43
2014	58171.54	9457.66	45464.47	35704.55	52349.08
2015	61682.29	11490.66	44284.42	29253.31	53381.34
2016	58027.71	13662.40	46849.77	28550.90	49,599.05
2017	60240.34	17081.63	54936.83	29843.25	44349.71
2018	63995.17	20496.70	60232.18	28169.04	47881.81
2019	77219.53	24129.09	63772.84	28968.73	67260.42
2020	77050.90	25670.62	58703.35	22728.75	65451.46
2021	60255.84	24822.40	63301.11	21289.88	52356.44
Average	62200.71	16068.85	52222.06	30354.48	51034.86

Source: Data extracted from Annual Reports of the companies from 2012 to 2021

ONGC's expenses fluctuated between ₹47466.05 crores and ₹77219.53 crores during the study. ONGC's expenses climbed by 21.98 percent in 2013, rising from ₹47466.05 crores to ₹57897.74 crores. Other significant changes in ONGC expenses include a 20.66 percent increase in 2019 from ₹63995.17 crores to ₹77219.53 crores and a drop of 21.80 percent in 2021.

PowerGrid's expenses have been steadily increasing. Expenses decreased by 3.30 percent in the final year of the research period. The average expenses incurred by PowerGrid is ₹16068.85 crores, representing a 17.01 percent increase.

Throughout the study period, SAIL's expenses fluctuated between ₹42134 crores and ₹63772.84 crores. The largest increase in expenses occurred in 2017 when they jumped to ₹54936.83 crores from ₹46849.77 crores in 2016.

BHEL's expenses have been reduced from ₹38922.93 crores in 2012 to ₹21289.88 crores in 2021. From 2018 to 2021, BHEL's expenses have been steadily dropping, owing to the company's declining income.

The GAIL's expenses increased rapidly from ₹40829 crores in 2012 to ₹48287 crores in the year 2013 and increased even more rapidly to ₹52349 crores the following year. In the year 2019, the maximum change in expenses is 40.47 percent.

Depreciation:

The depreciation of the selected public sector enterprises is shown in Table 3. ONGC's depreciation increased from ₹7495.92 in 2012 to ₹16327.38 crores in 2021. The average depreciation of ONGC is ₹12725.79 crores. ONGC's depreciation is moving between ₹7495.92 crores and ₹18616.86 crores.

The depreciation of PowerGrid is showing an increasing trend throughout the study period. It increased from ₹2572.54 crores in 2012 to ₹11711.68 crores in 2021, and the amount in between depreciations moving are ₹2572.54 crores and ₹11711.68 crores.

Table 3: Depreciation of Selected Public Sector Companies

YEAR/PSU	ONGC	POWERGRID	SAIL	BHEL	GAIL
2012	7495.92	2572.54	1567.03	800.00	980.94
2013	8373.57	3351.92	1402.98	953.39	790.71
2014	10925.89	3995.68	1716.69	982.92	1,176.15
2015	11458.31	5085.41	1773.28	1077.32	974.60
2016	11621.69	6182.76	2099.54	935.64	1,313.09
2017	12189.54	7662.80	2679.95	848.84	1,396.78
2018	14470.17	9091.25	3064.92	786.40	1415.14
2019	15778.62	10200.67	3384.72	474.81	1,550.22
2020	18616.86	11,073.18	3755.05	502.86	1,835.99
2021	16327.38	11,711.68	4102.00	473.05	1,907.88
Average	12725.79	7092.79	2554.62	783.52	1334.15

Source: Data extracted from Annual Reports of the companies from 2012 to 2021

The depreciation of SAIL has increased to ₹4102.98 crores in 2021 from ₹1567.03 crores in 2012. The fluctuation in SAIL's depreciation is very volatile. In the year 2016, depreciation increased to ₹2099.54 crores from ₹1773.28 crores in 2015. And SAIL has ranged depreciation between ₹1402 crores and ₹4102.00 crores.

BHEL's depreciation has shown a declining trend throughout the study period. It decreased to ₹473.05 crores in 2021 from ₹800.00 in 2012. In the year 2015, BHEL has also recorded the highest depreciation of ₹1077.32 crores and the lowest of ₹473.05 in 2021.

GAIL has shown fluctuating performance in depreciation. GAIL's depreciation was moving between ₹790.71 crores and ₹1907.88 crores. From 2012 to 2021, depreciation increased from ₹980.94 crores to ₹1907.88 crores. The average depreciation of GIL was ₹1334.15 crores during the research period.

It is seen from the table that ONGC and PowerGrid have charged highest depreciation than other sectors.

Financing Cost:

Tale 4: Financing Cost of Selected Public Sector Companies

Year	ONGC	POWERGRID	SAIL	BHEL	GAIL
2012	34.83	1,943.26	677.70	51.28	116.46
2013	27.64	2,535.22	747.66	125.27	195.02
2014	0.36	3,167.52	967.64	132.63	366.19
2015	2.79	3,979.32	1,454.23	91.65	361.30
2016	1,324.13	5,022.97	2,300.45	359.48	640.04
2017	1,221.74	6,303.83	2,527.82	350.61	479.36
2018	1,508.47	7,590.66	2,822.75	254.55	275.11
2019	2,492.14	9,091.42	3,154.92	287.29	138.54
2020	2,823.68	9,813.62	3,486.76	506.95	108.50
2021	2,214.54	8,501.01	2,817.14	373.09	155.90
Average	1165.03	5794.88	2095.71	253.28	283.64

Source: Data extracted from Annual Reports of the companies from 2012 to 2021

Table 4 shows the Financing Cost of selected public companies during the study period. ONGC's financing cost has climbed from ₹34.83 crores in 2012 to ₹2214.54 crores in 2021. In 2020, the maximum financing cost was ₹18616.86 crores. Financing costs nearly quadrupled to ₹1324.13 crores in 2016, up from ₹2.79 crores the previous year. ONGC's average financing cost is ₹1165 crores, with costs ranging from ₹0.36 crores to ₹2823.68 crores.

The financing cost of PowerGrid increased to ₹8501.01 crores in 2021 from ₹1943.26 crores in 2012. The average financing cost in PowerGrid is ₹5794.88 crores which is the highest amongst the selected companies. The financing cost of PowerGrid has moved between ₹1943.26 crores and ₹9813.62 crores.

SAIL's financing cost increased from ₹677.70 crores in 2012 to ₹2817.14 crores in 2021. There was a gradual increase in the financing cost of SAIL till 2020. Thereafter financing costs declined to ₹2817.14 crores in 2021, it was the only drop-in financing cost of SAIL during the study period.

BHEL's performance in financing costs was much fluctuating. The financing cost of BHEL increased from ₹51.28 crores in 2012 to ₹373.09 crores in 2021. In the year 2016, the

Table 5: Earning per Equity Share of Selected Public Sector Companies

Financing cost of BHEL increased massively to ₹359.48 crores from ₹91.65 crores in 2015. the Financing cost of BHEL was moving between ₹51.28 crores and ₹506.95 crores.

Earning per Equity Share (EPS):

Year	ONGC	POWERGRID	SAIL	BHEL	GAIL
2012	29.36	7.03	8.58	28.76	28.8
2013	24.46	9.15	5.25	27.03	31.71
2014	25.83	9.36	6.33	14.14	34.49
2015	20.73	9.52	5.07	5.80	23.96
2016	18.71	11.52	-10.02	-3.73	18.12
2017	13.95	14.37	-6.86	2.03	20.71
2018	15.54	15.75	-1.17	2.20	20.48
2019	20.86	19.00	5.27	3.35	26.72
2020	10.69	20.67	4.89	-4.23	14.68
2021	8.94	22.81	9.32	-7.80	10.85
Average	18.91	13.92	2.67	6.76	23.05

Source: Data extracted from Annual Reports of the companies from 2012 to 2021

EPS of ONGC declined from ₹29.36 per share in 2012 to 8.94 percent in 2021. In the year 2019 EPS of ONGC increased by 34.23 percent to ₹20.86 from ₹15.54 in 2018, this was the highest increase in EPS throughout the study period and the biggest decline was in the year 2020, when EPS dropped to ₹10.69 from ₹20.86 in 2019.

Because PowerGrid's efficiency in making PAT was high, the income per share increased year

after year during the study period.

Appreciably, PowerGrid maintains positive growth every year throughout the study period in EPS. EPS of PowerGrid increased to ₹22.81 in 2021 from ₹7.03 in 2012 with an average growth of 14.37 percent.

SAIL had been facing a loss from 2016 to 2018 continually, reflected in the company's negative EPS. EPS of SAIL is much volatile. The average EPS during the study period is ₹2.67, which is the lowest among other selected companies.

The EPS trend of BHEL is likewise quite volatile. BHEL's EPS in 2016, 2020, and 2021 were negative, with negative values of ₹3.73, ₹4.23, and ₹7.80, respectively.

On the other hand, GAIL has recorded better EPS than SAIL and BHEL. Throughout the research period, GAIL maintained a positive EPS. EPS of GAIL moved between ₹10.85 and ₹34.49 during the research period. In the last two years of the study period EPS of GAIL declined from ₹26.72 in 2019 to ₹14.68 in 2020 and then ₹10.85.

EPS is determined by PAT; as shown in the table above, the corporation achieved higher PAT while maintaining higher EPS.

Regression Analysis:

It is a statistical technique used to determine the strength of relationship between dependent variables (EPS) and independent variables (REV, EXP, FC and DEP) of firms as shown in the following equations:

$$EPS_{it} = \alpha_i + \beta_1 REV_{it} + \beta_2 EXP_{it} + \beta_3 FC_{it} + \beta_4 DEP_{it} + \epsilon_{it}$$

where α_i , $i = 1, \dots, 5$, is the unknown intercept for every company, t , $t = 2012, \dots, 2021$, represents the year analyzed, β_s are the coefficients for every independent variable and ϵ_{it} is the error term. The null hypothesis for the dependent variable EPS is that REV, EXP, FC and DEP have no impact on EPS, that is, $\beta_1 = 0$.

ONGC-

Table 6: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations
	B	Std. Error	Beta			Zero-order
(Constant)	15.968	6.904		2.313	0.069	
REV	0.001	0	1.228	3.938	0.011	0.015
EXP	-0.001	0	-1.246	-2.489	0.055	-0.512
FC	-0.002	0.002	-0.385	-1.437	0.21	-0.774
DEP	1.33E-05	0.001	0.007	0.017	0.987	-0.826

a. Dependent Variable: EPS

R Square: 0.948

Source: Computed by SPSS

The result is shown in table 6 that the explanatory variables explain 91 percent variation in EPS of ONGC. The table shows the impact of determinants of earnings on earnings per share of the company. From the table, it is clear that Revenue is the only variable that is low degree positively correlated with EPS at just 1.5 percent. Expenses are moderately negatively correlated with EPS at 51.2 percent. Financial Cost and Depreciation are highly negatively correlated with EPS at 77.4 percent and 82.60 percent respectively.

From the table, it is observed that only REV is statistically significant at 5 percent of level, whereas EXP is statistically significant at 10 percent level. But other variables FC and DEP are statistically significant neither at 5 percent nor at 10 percent level of significance.

The result shows there is no effect of Financial Cost and Depreciation on EPS of ONGC.

PowerGrid:

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations
		B	Std. Error	Beta			
1	(Constant)	-0.363	0.499		-0.727	0.5	
	REV	0.002	0	3.454	5.76	0.002	0.991
	EXP	-0.001	0.001	-1.794	-1.588	0.173	0.977
	FC	0.001	0.001	0.586	0.989	0.368	0.957
	DEP	-0.002	0.001	-1.255	-2.98	0.031	0.984
a. Dependent Variable: EPS							
R Square: 0.998							

Source: Computed by SPSS

Table 7 shows that the explanatory variables explain for 99 percent of the variation in PowerGrid's EPS. The table depicts the impact of earnings determinants on the company's earnings per share. The table shows that the correlation between EPS and all other variables, such as REV, EXP, FC, and DEP, is highly positive, with values of 99.10, 97.70, 95.70, and 98.40 percent, respectively.

Only REV is statistically significant at the 5% level, and DEP is statistically significant at the 5% level, according to the table. However, at the 0.05 percent threshold of significance, the variables EXP and FC are statistically insignificant.

The results reveal that Expenses and Financial Costs have little impact on PowerGrid's EPS.

SAIL:

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations
	B	Std. Error	Beta			
(Constant)	0.59	4.756		0.124	0.906	
REV	0.001	0.00014	2.275	10.15	0.0002	0.426
EXP	-0.001	0.0002	-1.864	-6.777	0.001	0.005
FC	-0.001	0.001	-0.113	-0.488	0.646	-0.267
DEP	-0.001	0.002	-0.091	-0.323	0.759	0.069
a. Dependent Variable: EPS						
R Square: 0.984						

Source: Computed by SPSS

Table 8 shows the interpretation of the explanatory variables for 98 percent of the variation in SAIL's EPS. The table depicts the impact of earnings determinants on the company's earnings per share. It is obvious from the table that the correlation between EPS and REV is moderately positive, at 42.6 percent. The correlation between EPS and EXP is only 0.4 percent, whereas the correlation between EPS and DEP is only 6.9%.

In the table, it can be seen that REV and EXP are statistically significant at the 5% level, however FC and DEP are not.

The results reveal that Financial Cost and Depreciation have little impact on SAIL's EPS.

BHEL:

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations
	B	Std. Error	Beta			
(Constant)	-7.418	9.074		-0.818	0.451	
REV	0.002	0.001	1.815	4.048	0.01	0.984
EXP	-0.002	0.001	-0.881	-1.975	0.105	0.955
FC	-0.006	0.008	-0.07	-0.733	0.497	-0.826
DEP	-0.002	0.005	-0.03	-0.372	0.725	0.458
a. Dependent Variable: EPS						
R Square: 0.989						

Source: Computed by SPSS

Table 9 shows that the explanatory factors responsible for 99 percent of the variation in BHEL's EPS. The table depicts the impact of earnings determinants on the company's earnings per share. The table shows that the correlation between EPS and REV is high degree positive, with a coefficient of 98.4 percent. The correlation between EPS and EXP is similarly high degree positive at 95.5 percent, while the correlation between EPS and FC is simply negative at 82.6 percent. Dep has a moderately positive correlation of 45.8%.

Only REV is statistically significant at the 5% level, according to the table, while EXP, FC, and DEP are not statistically significant at the 5% level.

The results reveal that Expenses, Financial Costs, and Depreciation have little impact on BHEL's EPS.

GAIL:

Table 10: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations
	B	Std. Error	Beta			Zero-order
(Constant)	31.391	9.438		3.326	0.021	
REV	0.003	0.001	4.176	2.011	0.101	-0.264
EXP	-0.003	0.002	-3.714	-1.85	0.124	-0.295
FC	0.009	0.012	0.218	0.802	0.459	-0.035
DEP	-0.022	0.005	-1.087	-4.678	0.005	-0.786
a. Dependent Variable: EPS						
R Square: 0.714						

Source: Computed by SPSS

Table 10 shows that the explanatory variables only explanation for 71 percent of the variation in GAIL's EPS. The table depicts the impact of earnings determinants on the company's earnings per share. Revenue and expenses are the variables having a moderate degree of negatively correlated with EPS, at 26.4 and 29.5 percent, respectively, as shown in the table. At only 3.5 percent, EPS and FC have a minimal degree of negative correlation. Depreciation has a 78.6 percent negative correlation with EPS.

Only DEP is statistically significant at the 5% level, whereas EXP is statistically significant at the 10% level, according to the table. Other factors REV and FC, on the other hand, are not statistically significant at either the 5% or 10% level of significance. Financial Costs and Expenses have no effect on GAIL's EPS, according to the results.

Conclusion:

According to the findings of the study, ONGC's earnings are higher than those of the other companies studied. GAIL, on the other hand, received the second most revenue throughout the study period, followed by SAIL. However, PowerGrid's performance is more stable than that of

other corporations; on the other hand, BHEL's performance falls short of its revenue potential. PowerGrid has the lowest expenses, which enables the company generate the highest earnings ratio. ONGC, on the other hand, has gained the most money in absolute terms.

GAIL has the highest EPS, followed by ONGC and PowerGrid, according to the report. However, PowerGrid's performance suggests that the Power Sector was unaffected by the Covid-19 Pandemic from 2019 to 2021.

Depreciation and financial costs have a minor impact on EPS, whereas revenue and other expenses have a considerable impact on the EPS of the organizations, according to the overall regression conclusion. In the instance of Revenue, the null hypothesis is rejected because the influence on EPS is significant at the 5% level. Other variables, on the other hand, are not as effective in all businesses.

It can be seen that revenue is the most important component in determining earnings, while other aspects have had a little impact depending on the industry.

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A Study on Effect of E-commerce With Special References to Women's Online Purchasing Behavior With Flipkart in Lucknow

***Dr. Shubhendu Shekher Shukla**

Abstract

Online shopping has become more common over time, in large part because consumers find it convenient to do from the comfort of their home or workplace. The primary goal of this study is to conclude how satisfied customers are with internet shopping. I think in the future, everything would be available on Flipkart, barring groceries and cars. The popularity of E-Commerce starts due to option of COD and EMI option for products. We can also create a relationship between a superior user experience on the e-commerce website in terms of usability, speed, and clarity and increased the loyalty of current customers and take customer retention one step farther than brand awareness.

Keywords : E-Commerce, Online Shopping, Consumer Behavior, Online purchasing.

1. INTRODUCTION

In 2007, Mr. Sachin Bansal and Binny Bansal, both graduates of the Indian Institute of Technology, Delhi, launched Flipkart, an online retailer. They had previously worked for Amazon.com. It only conducts business in India, and Bangalore, Karnataka, is home to its corporate headquarters. A Singapore-based holding company owns it, and it is registered there. With a four lakh rupee beginning capital, the company currently aims for an annual revenue of about Rs. 4500 crores. Flipkart has debuted its own line of home appliances and personal healthcare products under the moniker "Citron." Flipkart has also introduced its own product line under the name "DigiFlip". Flipkart first concentrated primarily on books, but as it grew, it also began to provide electronic devices, air conditioners, air coolers, stationery supplies, lifestyle products, and e-books.

2. HISTORY AND GROWTH OF FLIPKART

Since Flipkart is registered in Singapore and has a large foreign shareholder base, it is not an Indian corporation. Because multi-brand e-retailing by foreign corporations is prohibited in India, Flipkart sells goods there via WS Retail. The Flipkart platform also allows for the sale of

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goods by other independent vendors or businesses. At this time, Flipkart employs over 15000 workers. Cash on delivery, credit or debit card purchases, net banking, e-gift cards, and card swipe on delivery are just a few of the payment methods accepted by Flipkart.

One of the biggest online retailers in India right now, Flipkart offers products in over 14 different categories and has a presence in about 150 different cities. Currently, Flipkart employs 10,000 people, has 3000 sellers on its site, and ships 5 million packages each month. The company on Monday achieved record single day sales of Rs. 600 Crores thanks to Flipkart's "Big Billion Day" offer. By providing ground-breaking services like Cash on Delivery (COD), 30 Day replacement Guarantee, EMI choices, Flipkart mobile app, etc., it made its presence felt in online retailing.

Online shopping has become more common over time, in large part because consumers find it convenient to do from the comfort of their home or workplace, according to Mohana Priya. Online shopping's popularity during the Christmas season is one of its most alluring features because it eliminates the need to stand in line or browse from store to store in search of a certain item. The primary goal of the study is to determine how satisfied customers are with internet shopping. The results of the current survey show why people favor online websites and how satisfied they are with them.

Some of the goals that direct how Flipkart operates could be categorised as follows:

- Everyone is a priority, not only internet shoppers. They seek to promote the ease of online shopping to conventional offline consumers in order to expand the business.
- Their main goal is to have a diverse product range that includes electronics, home appliances, etc.
- In 2020, the primary goal is to penetrate the worldwide market, with a stronger supply chain and aggressive acquisitions as secondary goals.

3. MARKETING STRATEGY

- Word of mouth has primarily been used to promote Flipkart.
- Their finest marketing strategy has been customer happiness.
- In order to have a broad online presence, Flipkart utilised SEO (Search Engine Optimization) and Google Ad-words extremely wisely as its marketing strategies.
- To deliver an outstanding customer experience overall. In order to convey the concept that "if a kid can do it, so can we," children were used to make the advertisements.

4. BRAND AWARENESS & LOYALTY

A crucial component of market success is brand awareness. With 80% of the market, Flipkart is the market leader in the sector and offers products at the most competitive prices. A superior user experience on the e-commerce website in terms of usability, speed, and clarity can increase the loyalty of current customers and take customer retention one step farther than brand awareness.

5. FLIPKART'S SUCCESS MANTRA

- Users of Flipkart are happier than those of their rivals, and the company is known for providing excellent customer support.
- The user interface is stylish and simple to operate.
- Cash on delivery helps Indian customers, who have historically shied away from internet transactions, develop trust.
- Flipkart focuses on including the most important information on each page.
- An easily understood payment gateway
- Each product has a detailed description, and each image is taken from a variety of perspectives.

6. FUTURE ROAD MAP

In the future, everything would be available on Flipkart, barring groceries and cars. They'll consider making further supply chain investments. to broaden the categories as well as to enter them into a variety of new categories.

7. OBJECTIVES OF THE STUDY

The main goals of this study were to:

- Explore the unique qualities of female online shoppers;
- Determine whether these women's characteristics influence their online purchasing; and
- Focus just on individuals who shop online more frequently, whether they are men or women.
- Their primary goal is to diversify their product line to include electronics, home appliances, etc.

After that, we create a research framework and start gathering data. Data analysis and a discussion of the results are then presented. Future research directions and managerial consequences are indicated.

8. SCOPE OF THE STUDY

As the primary location for the research is Lucknow City

- The study is only conducted in Lucknow.
- The sample size does not accurately represent the cosmos as a whole.
- The study will discuss women's online shopping habits in relation to flipkart.com.
- Flipkart is the subject of extensive analysis because it is regarded as the top website in India. It is regal and well-known.

9. RESEARCH DESIGN & METHODOLOGY

Both primary and secondary data are used in the investigation.

9.1. Primary data

The primary data was collected through a questionnaire designed exclusively for the study. The questionnaire was designed to collect information about the demographic profile of the respondents such as age, gender, education and family monthly income. In addition to this various questions related to the knowledge and experience about online shopping, reason for choosing online shopping, type of products purchased online, factors affecting consumer's behaviour while online shopping etc...,

9.2. Secondary data : Secondary data was taken from research papers, Journals, magazines and websites.

9.3. Sample size: 42

9.4. Theoretical Framework

This paradigm is most suited for our inquiry because, as we included more aspects like "control," it was discovered that understanding the factors that determine women's attitudes has a direct and beneficial impact on women's intents to actually utilise the Internet for shopping. According to their attitudinal model of technology-based self-service, these characteristics are hypothesized to operate as key drivers for "ease of use" because they brought "customer attributes" and "situational effects" to the TAM framework. Apart from "ease of use," "usefulness," and "enjoyment," we integrated six factors consumer traits, situational factors, product characteristics, previous online shopping experiences, trust in online shopping, and product attributes to understand women's intentions to shop online. This is true even though various researchers modified the original TAM framework to suit their investigations.

10. DATA ANALYSIS AND INTERPRETATION

The following table shows the demographic profile of the respondents

Table 1:-

Online shopping experience

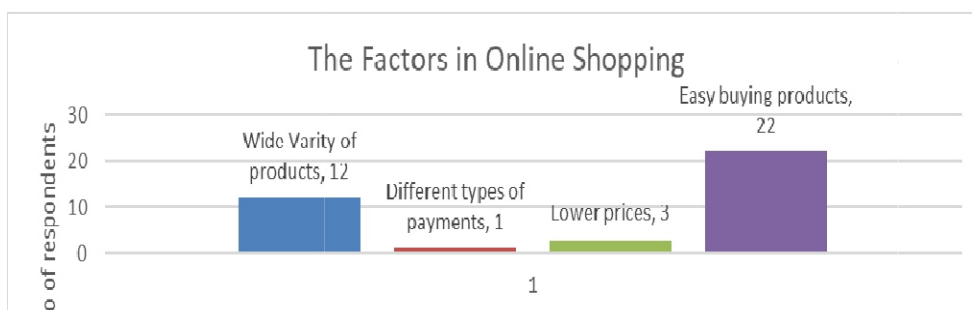
Particulars	Number of Respondents	% Respondents'
Below 1 year	4	9.52
1-2 years	19	45.23
3-4 years	11	26.19
Above 5 years	8	19.06
Total	42	100



Interpretation: Table 1 represents that; maximum respondents have an familiarity of 1-2 years of online shopping (45.23%)

Table 2:-
Factors that affect for choosing online shopping

Particulars	No. of Respondents	% of respondents
Wide Variety of products	12	28.57
Various modes of payment	1	2.38
Lower Cost	3	7.14
Easy product purchases	22	52.38
More discounts	4	9.53
Total	42	100



Interpretation: This one demonstrates how the majority of consumers believed that buying things online was simple. (Approx 52.38%).

**Table 3:-
Products purchased in online shopping**

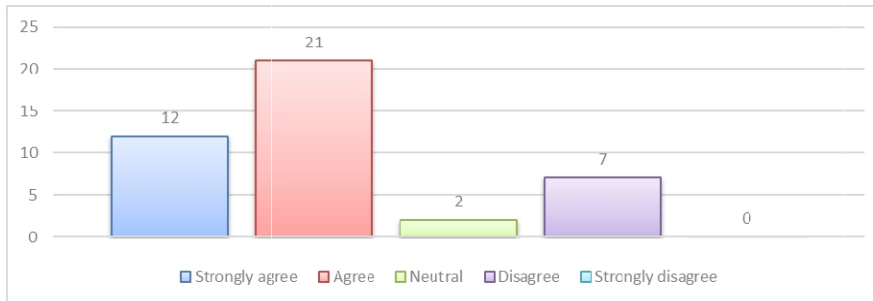
particulars	No.of Respondents	% of respondents
Books	12	28.57
CD/video	6	14.28
Soft wares	0	0
Gifts	6	14.28
Tickets	1	2.38
Clothes	1	2.38
Gadgets	16	38.11
Total	42	100



Interpretation: This one demonstrates that the majority of respondents favoured using gadgets that were available online. (Approx 38.11%) .

**Table 4:-
Online shopping saves time,**

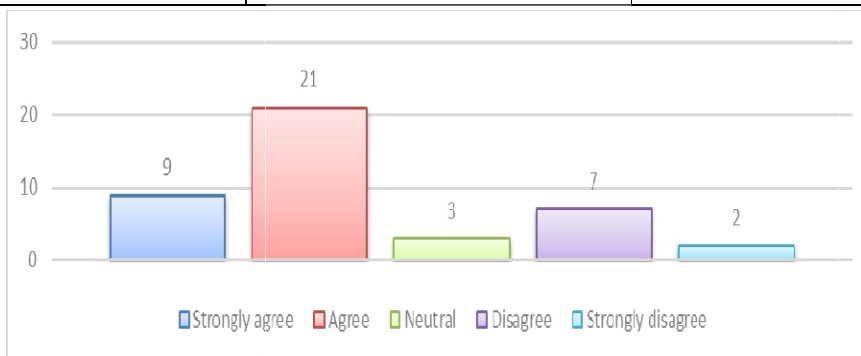
Particulars	No. of Respondents	% of respondents
Strongly agree	12	28.57
Agree	21	50.00
Neutral	2	4.76
Disagree	7	16.67
Strongly disagree	0	0
Total	42	100



Interpretation: This one demonstrates that the majority of consumers concur that time is saved while purchasing online. (Approx 78.57%)

**Table 5:-
Online shopping saves money**

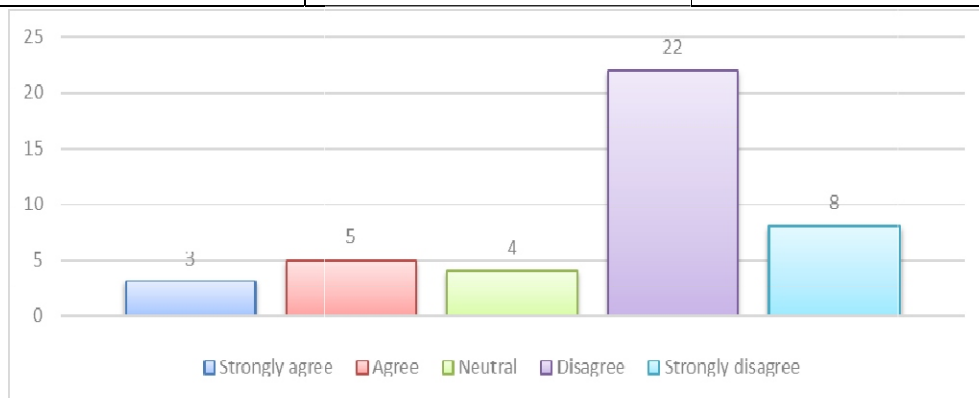
particulars	No. of Respondents	% of respondents
Strongly agree	9	21.42
Agree	21	50.00
Neutral	3	7.14
Disagree	7	16.67
Strongly disagree	2	4.77
Total	42	100



Interpretation: This one demonstrates that the majority of respondents (Approx 71.42%) believed that online shopping saves money.

**Table 6:-
Online shopping is risky**

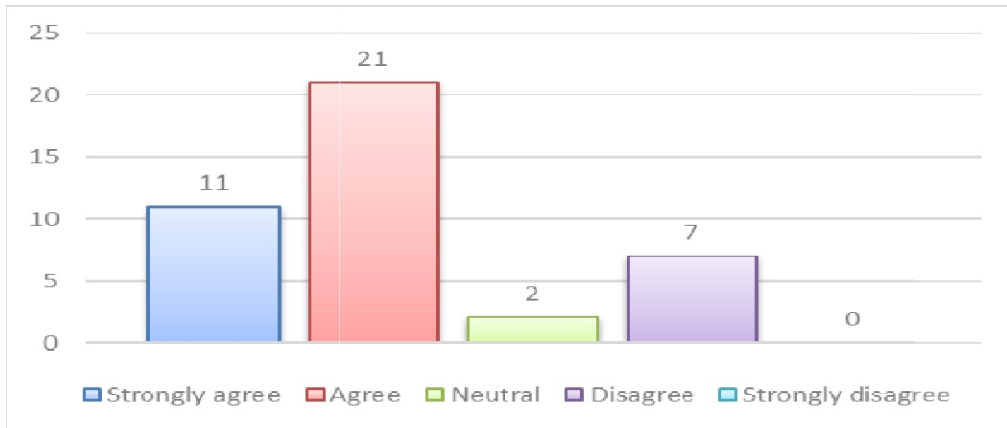
Particulars	No.of.respondents	% of respondents
Strongly agree	3	7.14
Agree	5	11.90
Neutral	4	9.52
Disagree	22	52.38
Strongly disagree	8	19.06
Total	42	100



Interpretation: This one demonstrates that the majority of respondents (71.44%) disagree that online purchasing is dangerous.

**Table 7:-
It is easy to choose and make comparison with other products while shopping online...**

Particulars	No. of Respondents	% of respondents
Strongly agree	11	26.19
Agree	21	50.00
Neutral	2	4.76
Disagree	7	16.67
Strongly disagree	0	0
Total	42	100

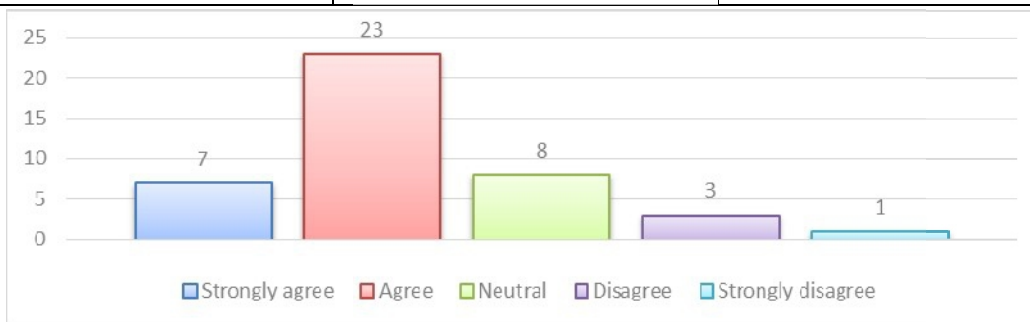


Interpretation: This demonstrates that the majority of respondents (Approx 76.19%) felt that buying online makes it simple to compare products and make choices.

Table 8:-

Get on-time delivery by shopping online

particulars	No. of Respondents	% of respondents
Strongly agree	7	16.67
Agree	23	54.76
Neutral	8	19.04
Disagree	3	7.14
Strongly disagree	1	2.39
Total	42	100

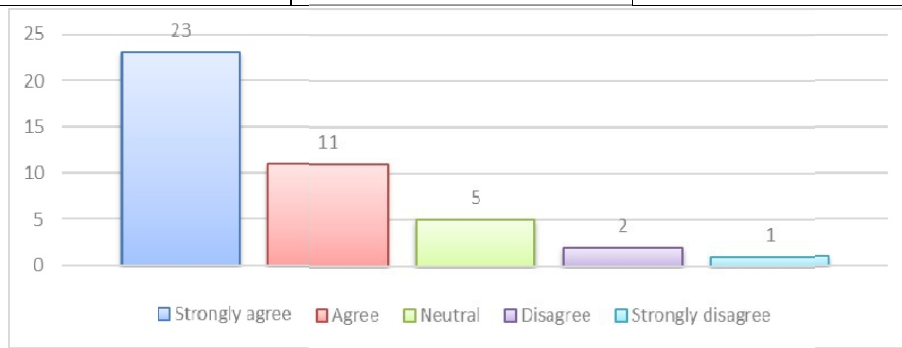


Interpretation: This one demonstrates that the majority of respondents (Approx 71.43%) agreed that internet shopping ensures on-time delivery.

Table 9:-

The website design helps in searching the product easily..,

particulars	No. of Respondents	% of respondents
Strongly agree	23	54.76
Agree	11	26.19
Neutral	5	11.90
Disagree	2	4.76
Strongly disagree	1	2.55
Total	42	100

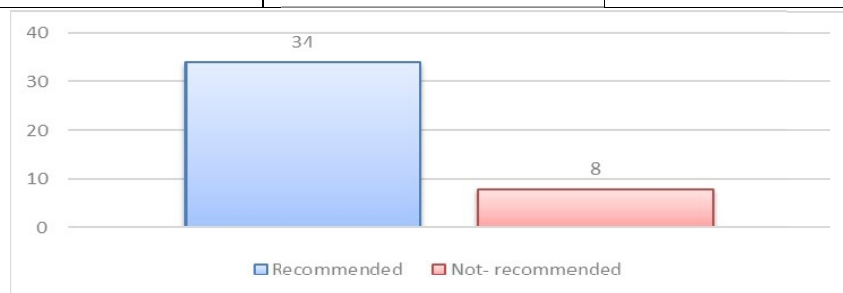


Interpretation: This demonstrates that the majority of respondents (Approx 80.95%) felt that the website's layout makes it simple to find products.

Table 10:-

Recommendations to non-online buyers for online shopping..,

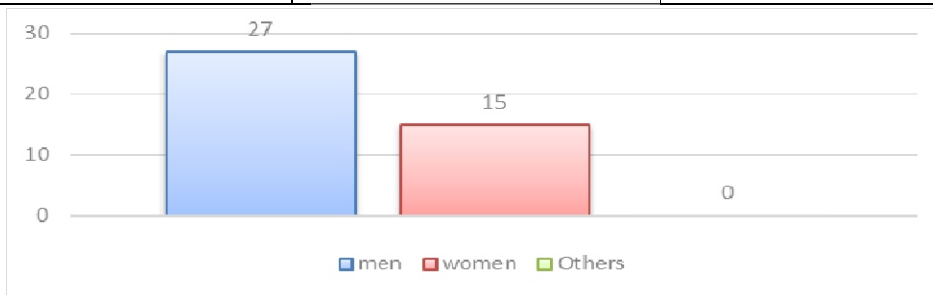
particulars	No. of Respondents	% of respondents
Recommended	34	80.95
Not- recommended	8	19.05
Total	42	100



Interpretation: This demonstrates that Recommendations to non-online purchasers for online purchasing were accepted by a majority of 80.95% of respondents.

**Table 11:-
Who are more interested to spend time in online..,**

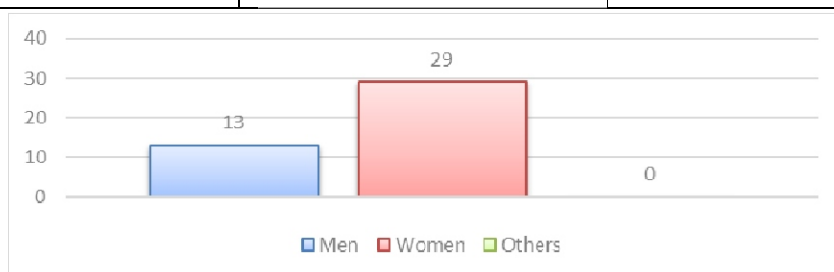
particulars	No. of Respondents	% of respondents
men	27	64.28
women	15	35.72
Others	0	0
Total	42	100



Interpretation: This one demonstrates that the majority of respondents (approx. 64.28%) were in agreement that they prefer to spend time online.

**Table 12:-
Who are more attracted to online advertisements and promotions..,**

particulars	No. of Respondents	% of respondents
Men	13	30.95
Women	29	69.05
Others	0	0
Total	42	100



Interpretation: This statistic demonstrates that the majority of women, 69.05%, concur that they are more drawn to internet promotions and marketing.

Interpretation: This statistic demonstrates that the majority of women, 69.05%, concur that they are more drawn to internet promotions and marketing.

1. FINDINGS

The following are the conclusions we reached from this study:

- Starting with demographics, the results of the age correlation showed that there is a very substantial association between attitude toward online shopping and age, i.e., senior individuals are not particularly interested in doing so. This would make it easier for internet shops to develop strategies for various age groups.
- The tendency of online shoppers with various levels of education was also observed through correlation, and the results revealed a very strong positive connection between education and attitudes toward online purchasing, indicating that more education makes online shopping more alluring.
- Table 1 demonstrates that a large portion of the sample's age group is between the ages of 18 and 30.
- Table 3 demonstrates that the majority of respondents (52.38%) believed that buying things online is simple.
- The majority of respondents (71.44%) believe that there is no risk associated with internet purchasing, as shown in Table 5.
- Table 9 demonstrates that 76.19% of respondents believed that it is simple to choose and compare products when buying online.
- Table 10 demonstrates that the greatest percentage of respondents (80.95%) recommend that non-online purchasers switch to being online customers.

2. SUGGESTIONS

2.1. Greater Understanding Of Online Shopping

Through this study, we discovered that the demographic issues of age, education, and income were accepted for online shopping, but the rate is higher when respondents are young, higher education respondents strongly accepted the same, and respondents from higher income groups. It implies that there is a clear need for an awareness campaign for internet buying. The awareness of retail online customers for online purchasing should be planned in a variety of methods.

2.2. Multiple Payment Methods:

Only a small number of Indians own credit cards, which deters some people from shopping online. As a result, online shops must increase their payment options in order to attract more customers. The consumer ought to have more options available to them, such as Cash-on-Delivery, money transfers, checks or demand draughts, and end-to-end payment, so they can select the option that best suits their needs.

2.3. Awareness Regarding Security Measures:

Security concerns remain a significant barrier, thus it is necessary to emphasise trends like AVS (Address Verification System), PIN for credit cards, smart cards, digital signatures, e-cards, and simpler intra- and inter-bank internet transactions. It's also important to educate customers about the importance of using secure internet connections alone.

2.4. Point Out The Economic Benefits Of Shopping At Home:

Customers should be persuaded of the advantages of buying from home instead of having to endure the discomfort of venturing out in congested areas.

2.5. Make the prices more affordable:

Only then would clients feel encouraged to make an online purchase if the price supplied for online shopping is made more competitively compared to the cost of the goods accessible in the local shops.

2.6. Place Emphasis On The Special Offers:

Customers should be informed of the various sales promotion programmes, as they will increase the appeal and acceptance of online shopping among consumers.

2.7. Places a Focus on After-Sale Service:

The largest obstacle to internet buying growing in popularity is the "who is to blame" question. If the product is not working properly? Therefore, there should be a greater emphasis placed on the quality and longevity of the products being sold, together with the promise of after-sale service.

3. CONCLUSION

According to the thesis, a woman's age and computer experience affect whether or not she makes online purchases. The biggest drawback to internet buying was the inconvenience of making payments, while the biggest advantage was ease. Specific guidelines for marketers who target women in this demographic were produced after it was revealed that a number of factors could boost the likelihood of women completing online purchases. Additionally, a model that predicts consumers' intent to buy in an online setting was changed to concentrate on women's online shopping intents.

The data for this theory points to a relationship between computer experience, computer use frequency, and the likelihood that women will make online purchases. Online purchases are more likely when a person uses a computer and the Internet more frequently and has more computer skills. Even within this relatively small age range, it was shown that women's intentions to shop online were related to their age; those over 50 made less online purchases than those between the ages of 18 and 30.

In order of significance, payment inconvenience, concern over internet fraud, and concern over the abuse of personal information were the three biggest barriers to women shopping online. These three challenges can be seen as linked together, and there are many underlying causes for their significant roles as difficulties. The discomfort associated with the three barriers stems from concerns about draining one's bank account of funds and failing to receive the desired item. These

worries may be exaggerated and the result of extensive media coverage as well as the failure of online merchants and banks to offer secure payment options to their customers.

In this survey, convenience and the capacity to save time were identified as the most significant advantages women considered Internet buying to have. Other significant advantages include lower costs offered by internet retailers and the ability for women to shop online from merchants that may not be accessible to them locally. The fact that women have busy schedules makes convenience and time savings the biggest advantages of online buying. There were several things found that might increase the amount of online buying by the target demographic. These were divided into three categories:

1. "Price related factors" was the first category. These elements had to do with the price range of the goods provided in the online store and marketing initiatives that intended to give reduced costs.
2. The second area was "catalog-related factors," which suggested that if a catalogue were issued by the business running a web store, online shopping would grow.
3. The need of comprehensive advertising to remind the women in the researched age range of the existence and the possibilities connected to making purchases online was brought up in the third section, "advertisement related aspects."

Given their sizeable demographic, significant spending power, and yearly growth in Internet transactions, middle-aged women's online shopping behaviour is a particularly attractive field for research. A wider age range or a new industry for the investigation should be considered in future studies. The study could involve a quantitative survey conducted across the country with the goal of gathering detailed data on women's online buying behaviours and sentiments. The goal is to develop approaches for adjusting marketing tactics so that more women in the target age group engage in online shopping.

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