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International Journal of Research in Finance and Marketing

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Contents

ANALYSIS OF FINANCING INFRASTRUCTURE ROJECTS WITH PRIVATE SECTOR PARTICIPATION IN INTERNATIONAL PRACTICE

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ABSTRACT

This article focuses on the important aspects of public-private partnership in the development of "green" economy. The concept of "green" economy, its essence has been revealed, it is based on the importance of introducing "green" technologies, which allow the transition from a wasteful business model to an environmentally friendly model . The main directions for the development of the "green" economy, which is widespread in most countries, including Uzbekistan, have been defined

Keywords: *financing, public-private partnership, green energy, banking and financial products, green bonds, The development of the private sector and entrepreneurship, PPP prtojects.*

INTRODUCTION

It is known that the main internal sources of investment in the economy are, first of all, the state and private business entities operating in the country. Therefore, according to economists, public-private partnership in economic development is an institutional and organizational cooperation aimed at attracting investments in projects of high socio-economic significance in a wide range of areas of activity and their implementation. “Due to the lack of opportunities to solve problems such as hunger, poverty, and social inequality in society in the short term, high social value can be created in the country through long-term investment and management strategies through public-private partnership 1.” Public-private partnership is an institutional and organizational alliance between the state and private business to implement socially significant projects and programs in areas ranging from research to services. We can distinguish three types of efficiency gains from implementing projects based on public-private partnerships:

1. Economic efficiency – in most cases, refers to the benefits that the private sector will achieve. The added value created as a result of the private sector's participation in the partnership should be reflected in economic efficiency.
2. Political effectiveness is understood as the achievement of the goals set by the state in domestic and foreign policy as a result of public-private partnerships.
3. Social impact - as a result of the implementation of public-private partnerships, aspects such as the development of infrastructure in the country, improvement of the transport and communication system, and creation of additional jobs are taken into account.

Currently, from the experience of developed countries, we can observe that public-private partnerships play a major role in developing the country's economy, effectively implementing large infrastructure projects, and improving social infrastructure in the country. In this regard, studying the experience of developing countries and introducing their practices to our country is an important task.

it is urgent for governments and businesses to address 2the economic and social problems caused by inadequate or dysfunctional infrastructure around the world ." In this regard, the main factors that can hinder the economic growth of our country are the underdevelopment of infrastructure sectors such as transport, energy, and utilities, as well as the lack of investment in these sectors to implement the necessary investment projects for the development and modernization of infrastructure facilities, and the low level of attraction of modern technologies. One of the most effective methods in world practice for solving such problems is the implementation of investment projects based on public-private partnerships.

In his Address to the People of Uzbekistan in the Oliy Majlis, our President Shavkat Mirziyoyev emphasized the need to make full and effective use of the opportunities of publicprivate partnership in the implementation of investment projects. Indeed, in our country we have achieved great results in the areas of preschool education, housing and communal services, "neighborhood" work, investment, public services, and public-private partnership. The development of the private sector and entrepreneurship has become an irreversible process. The activity of our population, their desire for modern technologies and professions is increasing. New directions and areas are being created in our economy every day . At the same time, our President Shavkat Mirziyoyev emphasized that "it is necessary to fully and effectively use the opportunities of privatization and public-private partnership in attracting active investments 3. "

In the conditions of a modern market economy, public-private partnership is an effective tool for economic and social development at the national and regional levels, and is a means of attracting and implementing funds for investment projects aimed at maintaining control by state and local government bodies and establishing effective economic cooperation with the private sector. In investment projects based on public-private partnership, the private sector performs the functions of financing and managing investment projects on the basis of the conditions and requirements established by the state. The use of private sector funds in the development of infrastructure is of great importance for developing economies.

According to scientific research, an increase in the volume of private sector investments in the economy contributes to a significant increase in GDP for developing countries. Improving infrastructure using private sector funds is one of the important factors ensuring the economic development of a developing country.

The generally high expenditure or debt requirements of low-income and developing countries may reflect their overall public balance sheet performance. In these countries, the lack of funds to finance large-scale infrastructure projects, the general government budget deficit, and fiscal constraints may increase the interest of countries in expanding PPPs. It is also predicted that "higher macroeconomic instability will lead to greater PPPs", but this may reduce the attractiveness of PPP projects for private investors who prefer a business environment with lower financial risk. Other factors, such as inflation and public debt, which are theoretically important predictors of macroeconomic stability (or instability), are not the main important factors of PPP practice. In general, it can be assumed that the level of inflation will have a negative impact on the number of PPPs, since the lack of price stability may reduce the risk appetite of private investors and thus discourage them from investing in PPP projects. In our opinion, one of the arguments for the lack of a positive relationship between inflation and PPPs is that many private enterprises may be more inclined to receive price or revenue guarantees, minimum profitability guarantees, from the state to protect themselves from the negative effects of high inflation.

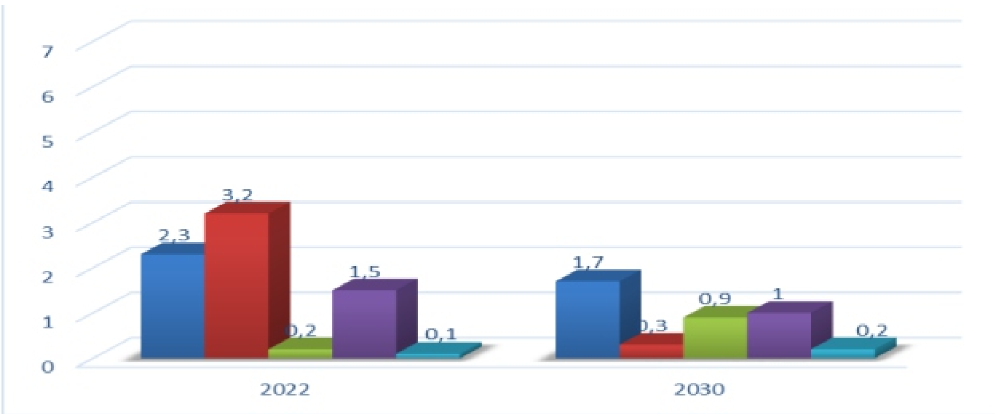

Figure 1. Amount of funding required to achieve high performance on the Sustainable Development Goals by 2030 in developing and middle-income countries (as a percentage of GDP)[4]

When analyzing the amount of investment required to achieve high performance in the Sustainable Development Goals in developing and middle-income countries by 2030 in relation to GDP, it can be observed that by 2030, the demand for infrastructure in such countries will decrease, in particular, the volume of investment projects expected to be implemented in healthcare, education, energy, transport and water management is on a downward trend compared to today. At the same time, the amount of investment funds expected to be allocated to the education and healthcare sectors is 5.5 percent of GDP in 2022, while this indicator is projected to be 2 percent by 2030.

Private sector investment in infrastructure in 2021 amounted to US$76.2 billion across 240 projects, representing 0.26 percent of GDP in all low- and middle-income countries. This represented an increase in investment compared to US$51.0 billion across 251 projects in 2020. Private sector investment increased by 49 percent compared to 2020, showing clear signs of recovery. However, investment in 2021 was 12 percent below the previous five-year average (2016-2020). The number of projects decreased by 4.4 percent from 2020 levels (Figure 2.1). Despite a lower number of projects compared to 2020, more countries reported PPP projects in 2021. There were 50 countries with PPP investments in 2021 , up from 45 in 2020. Of the 50 countries with PPP projects, 19 are located in Sub-Saharan Africa.

According to the United Nations' analysis of the 2030 Sustainable Development Goals, low-income developing countries in the world currently need about 4.7 percent of their gross domestic product to achieve high economic efficiency, and this figure is projected to exceed 15 percent by 2030. The largest share of this is observed in the areas of health, education, and transport infrastructure. In our opinion, further expansion of public-private partnerships in financing the infrastructure of developing countries will play an important role in meeting the demand for infrastructure in countries.

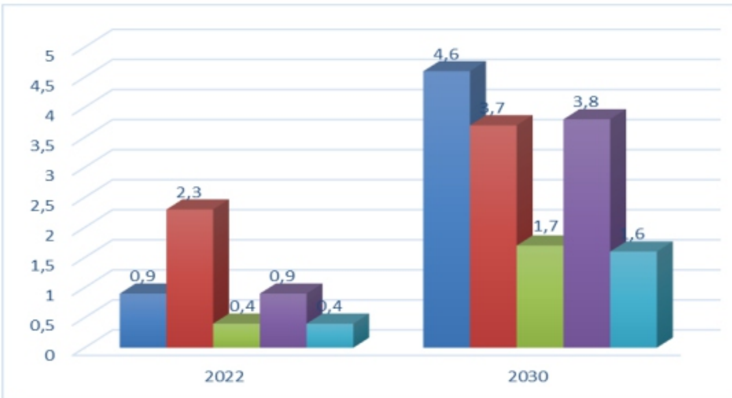

Figure 2. Low-income developing countries by 2030: Amount of funding required to achieve high performance on the Sustainable Development Goals (as a percentage of GDP)[5]

The recovery in private sector investment in infrastructure (as well as private participation in infrastructure) in low- and middle-income countries of the world, which began after the COVID19 pandemic, continued through 2022. Overall, the private sector achieved investment of US$91.7 billion across 263 projects, equivalent to 0.25 percent of gross domestic product (GDP) (Figure 2.2) . This represents a sustained recovery in total investment to pre-pandemic levels, exceeding the previous five-year average (2017-2021) by 4 percent in 2022.

However, the total number of private infrastructure participation projects in the region (low- and middle-income countries) has decreased to 263, down from the pre-pandemic level of 300 projects.

Most regions—Europe, Central Asia, and Sub-Saharan Africa (excluding South Africa)—have seen significant improvements in PPPs compared to the previous year. Although Sub-Saharan Africa (SSA) has seen relatively low levels of PPP investment, it has reached the milestone of having 19 countries with

PPPs by 2021, the highest number recorded in the history of the private investment operations database.18 countries in the DRC received investments worth US $4.7 billion in 30 projects in 2022. This represented a 26.1% increase in investment compared to 2021 and a 22% decrease from the previous five-year average of US$6.1 billion (25 projects in 15 countries).

This significant increase in PPP investments can be explained by the large growth of the road sub-network. Investments in roads are historically the largest sector. Investments in the transport sector, which doubled in 2021 compared to 2020, recorded a further increase in 2022.To highlight the importance of putting climate change issues on the agenda, the World Bank launched a public-private partnership database, and data collection on electric vehicle charging stations began in 2022. Tajikistan became the first country to have an electric vehicle charging station in the PPP database .

The energy sector accounted for a significant share of global private investment in 2022, accounting for 28% of total private infrastructure investment ($25.9 billion , 136 projects). This represents an increase of 21% compared to the previous year.

PPP investments in the energy sector are increasingly focusing on environmental sustainability. In terms of additional capacity, 85 percent of new power generation projects in 2022 will be renewable, compared to an average of 63 percent in the previous five years.Private sector participation in infrastructure projects through decentralized financing increased in 2022 , with 68 projects approved. This accounted for 26 percent of all PPP projects, an increase from 2020 and 2021. Approximately 35 percent of PPP financing came from government sources, 50 percent from private sources, and 15 percent from decentralized private sector financing projects.

Of the 263 projects registered in 2022, 114 (44%) were sponsored by foreign entities.This is compared to 45% in 2021 and 44% in 2020. Foreign sponsors are focusing on energy, with 85 (63%) of the 136 projects in this sector. 34% of the investment volume (US$30 billion) was sponsored by foreign entities.

Post-pandemic private participation in infrastructure recovery continued in 2022. PPP investments in 2022 amounted to US$91.7 billion across 263 projects, representing 0.25 percent of the GDP of all low- and middle-income countries. This compares to US$74.5 billion across 235 projects in 2021. This reflects the ongoing level of recovery prior to the pandemic, with total investments in 2022 4 percent higher than the previous five-year average (2017-2021). However, the total number of PPP projects decreased to 263 from the pre-COVID-19 level of 380.

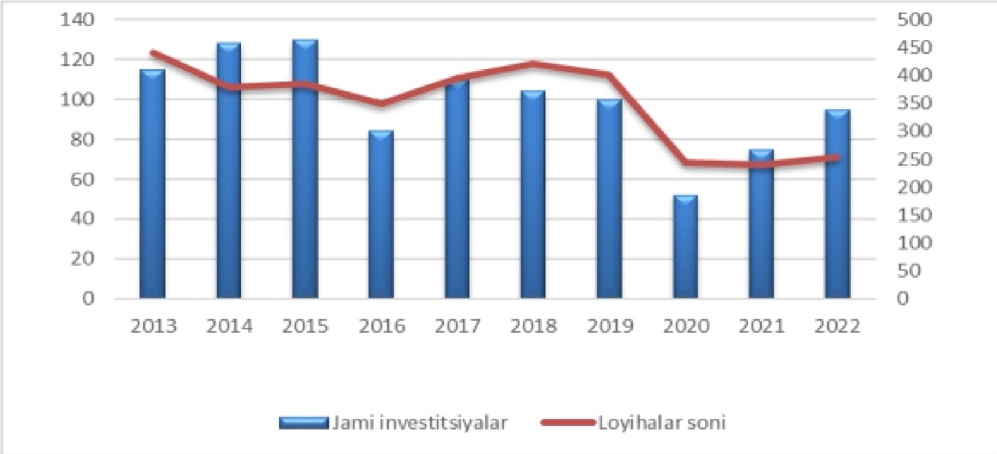

Figure 3. Investment in infrastructure projects involving PPPs in low- and middle-income countries, 2013–2022 (in billions of US dollars)[6]

All regions except Europe and Central Asia and Sub-Saharan Africa recorded significant improvements in PPPs compared to the previous year. Investments in East Asia and the Pacific, Latin America and the Caribbean and South Asia reached pre-pandemic levels in 2022. In addition, there was significant growth in the Middle East and North Africa. PPP investments increased in 2022 compared to the previous year. However, although the South Asia region had a lower level of PPP investments compared to 2022, it reached a significant milestone in 2021 with investments in 19 countries. This means that in 2022, China, Brazil, India, Indonesia and Vietnam had the largest share of PPPs in absolute terms. These five countries together attracted US$68.3 billion. The five countries with the highest investment levels as a share of national investment in 2022 were: Palau, 10.1 percent of GDP, Lao People's Democratic Republic, 5.6 percent; Senegal, 4.6 percent, with PPP investment.

CONCLUSIONS

As a result of the conducted scientific research, we can make the following proposals regarding the use of public-private partnership mechanisms in the development of the green economy :

• It is necessary to speed up the energy reform and introduce mechanisms that encourage the efficient use of energy. It is appropriate to allow rapid depreciation in the national economy, where energy consumption is 2 times higher than in other countries .

• Financial support to private investors through the introduction of "green energy" bank finance products in public-private partnership projects in the field of energy , as a result, allows expanding the scope of attracting investors to projects . At the same time, it increases the possibility of using new and cheap financial resources in the financing of PPP projects.

The Agency for the Development of Public-Private Partnerships should form a database of investment projects based on public-private partnerships and provide information about these projects to any private sector representatives. This database should contain information about whether investment projects are at the republican or local level, in which region they will be implemented, which sectors or industries they cover, and their current status (planned, in the tender process, construction and operation, etc.). In addition, the cost of the implemented projects, their implementation period, specific features, and information about the private partner should also be provided. The Departmet of the Development of Public-Private Partnerships under the Ministry of Economy and Finance of the Republic of Uzbekistan, as an authorized body in the field of public-private partnerships, shall:

- to keep track of infrastructure projects implemented and under development in our country, to identify the sources of funds allocated to them and planned to be spent in the future;
- development and implementation of measures to prevent the monopoly of private investors in the implementation of investment projects as an institutional structure coordinating publicprivate partnership relations;
- Development of a separate government program so that our country can also have the QI(Quality Infrastructure) index, which determines the level of development of countries' infrastructure at the international level;
- to generate real data on the investments being made in infrastructure in our country, especially the amounts of private investments, and on completed and ongoing infrastructure projects, and to ensure their accessibility to users, in particular, to ensure their reflection in the research databases of international organizations and international financial institutions, such as The Global Infrastructure Hub.

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ADOPTION OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES (GSCM): A STUDY OF MULTINATIONAL ORPORATIONS (MNCS) WITH SPECIAL REFERENCE TO ECO-FRIENDLY INITIATIVES

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ABSTRACT

This research seeks to explore the extent to which GSCM has been implemented in MNCs and the green initiatives that have been undertaken by these firms. With rising regulatory requirements, increased demands from the stakeholders, and constantly rising awareness of the environmental concerns, the MNCs are extending sustainability into the supply chain. The factors that compel organizations to implement GSCM and the problems associated with it like cost and technical know-how are established in this study. It also evaluates the operational performance, cost effectiveness, and brand management in relation to GSCM practices. Using an online survey conducted with 250 supply chain managers and sustainability officers from different industries as the sample data and following the quantitative method, structured questionnaires were distributed and completed. The research shows that although the engagement of GSCM practices is proven useful in business, with its advantages being the improvements in brand image as well as the compliance with environmental regulations, it is not without its shortcomings. The study enhances the understanding of the best strategies to be adopted in GSCM and creates awareness of what MNCs facing environmental challenges in their operations mitigate to enhance the performance of their operations.

Keywords: *GSCM, Multinational Corporations, Sustainability, Perception, Environmental Responsibility.*

Introduction:

The concept of GSCM has gained significant importance to MNCs for bringing down the portfolio of environmental cost without compromising global competitiveness. With environmental issues integrating the organizational and consumers' list of priorities as well as the regulatory framework, MNCs have begun implementing environmentally sensitive measures within their supply chain to clarify organizational sustainability performance. In the case of both the seriation of GSCM practices, they are considered not only as an answer to increasing regulation and more critical stakeholder expectations, but also a valuable measure on the operational level to enhance organizational effectiveness as well as cost leadership and innovation.

Therefore, GSCM comprises of various activities intended at lowering the impact of supply chain management on the environment.

Some of these practices include; sustainable sourcing which is wrongly selecting suppliers based on their performance to the environment or their sustainability policies; waste minimization is one of the most common practices of environmentally sustainable supply chain and it involves the minimization of wastes produced during the chain processes such as production; energy efficiency; the supply chain should be keen on using energy that consumes little or no greenhouse gases and; uses of environmentally friendly material; this involves the use of raw These practices are beneficial to MNCs as they are forced into maintaining high environmental compliance while also improving on their public image, cutting costs, and encouraging idea generation.

The following are some of the reasons that lead to the implementation of GSCM practices. It is due to the fact that governments from different countries have realized the importance of protecting environment and have laid down rigid rules and regulation. These regulations ensure that MNCs avoid practices which have negative impacts on the environment thus adopting sustainable practices of supply chain. Other variables include market forces that, whereby customers and other stakeholders within the market have begun placing more emphasis on sustainable resources. Today there is a trend where MNCs who show corporate social responsibility especially through environmental conservation are then rewarded with customers loyalty and investors' confidence.

Also, organizational resources and knowledge determine the degree of GSCM practice adoption possible at an organisation.

Despite the advantages, the implementation of GSCM practices is not without challenges. One of the primary barriers is the cost associated with adopting eco-friendly initiatives. Sustainable practices often require significant upfront investment, which can be a deterrent for some organizations. Another challenge is the lack of expertise and knowledge required to implement and manage these practices effectively. Additionally, integrating sustainability into existing supply chain processes can be complex and may require significant changes to established practices and relationships.

This study aims to explore the adoption of GSCM practices by MNCs, focusing on the drivers, challenges, and outcomes associated with these eco-friendly initiatives. By analyzing the integration of sustainability into supply chain operations, the study seeks to understand the strategies employed by leading MNCs, the benefits they derive, and the barriers they encounter.

Objectives:

1. To identify the imperative factors that can either promote or hinder the implementation of GSCM, especially within the multinational context, factors such as regulatory factors, market factors, and organizational factors shall be examined.

2. To examine the effects of environmentally friendly measures on the operational and environmental performance of multinational corporations (MNCs), evaluating advantages such as financial savings, improved brand reputation, and adherence to environmental regulations.

Literature Review:

There is a significant literature on the implementation and usage of (GSCM) with special emphasis on drivers, factors, benefits, and risks. Using a global context, (Asif et al. , 2020) show that key to GSCM adoption in developing nations is the need for the implementation to be collaborative. It also focuses on the idea that the collaboration between the stakeholders is vital for the implementation of the enacted green practices, as the resources and knowledge may be shared among the

In a similar vein, to study the performance results of GSCM under institutional pressures and environmental orientation, (El-Garaihy et al. , 2022) designed a study. It is realized that sources of institutional pressures together with environmental orientation, has significant influence in determining green practices, hence; enhancing performance results improved. Specifically, based on their research, El-Garaihy et al. state that pressure from outside and inside organizational environments is significant for actualization of proper GSCM practices

Giuffrida and Mangiaracina (2020) present a detailed analysis of green practices different industries, regions and technology domains. Some classify methodological types of GSCM and suggest a set of research questions to fill the existing gaps in the literature. This is a clear indication that there is the need to develop RI and CI industry-specific and region-specific GSCM strategies (Giuffrida & Mangiaracina, 2020).

Hebaz and Oulfarsi (2021) also explained the driving forces and detracting factors for GSCM implementation; this is especially because the advantages of the green practice are well understood while the problems like high cost and lack of knowledge are still rampant. Their review highlights the need to give attention to such barriers to be able to come up with relevant strategies towards enhancing GSCM adoption (Hebaz & Oulfarsi, 2021).

Altogether, these works add up to capture the complexity of the GSCM adoption which focuses on the relationship of drivers, barriers and contexts that affect the implementation of green supply chain management.

Methodology:

This study utilises a quantitative research methodology to examine the implementation GSCM strategies by multinational enterprises (MNCs). A Likert scale-based structured questionnaire was developed to assess the level of GSCM implementation and its influence on performance. The scale from 1 to 5 indicates the level of agreement with a statement, where 1 is "Strongly Disagree," 2 indicates "Disagree," 3 shows "Neutral," 4 termed as "Agree," and 5 is "Strongly Agree." In order to obtain a broad sample, the study focused on 250 supply chain managers and sustainability officers from 5 multinational corporations (MNCs) in different industries. The findings offer valuable understanding of the factors, difficulties, and results of GSCM methodologies in the selected companies.

Result and Discussion:

Table 1: Data Analysis

Questionnaire Items	"1"	"2"	"3"	"4"	"5"	Total Responses
1. Our organization actively incorporates environmental criteria into supplier selection.	30	45	60	70	45	250
2. Implementing GSCM practices has improved our company's operational efficiency and reduced costs.	25	40	55	80	50	250
3. The top management is fully dedicated to adopting and implementing GSCM principles in our entity.	20	35	50	85	60	250
4. We face significant barriers (e.g., cost, lack of expertise) in implementing eco-friendly supply chain initiatives.	40	50	70	60	30	250
5. Our customers demand environmentally sustainable products and supply chain practices.	15	30	40	100	65	250
6. Adoption of GSCM practices has enhanced our company's brand image and compliance with environmental standards.	10	25	55	90	70	250

The GSCM research, 'performs' a pattern of thinking about the adoption of practices of GSCM by the MNCs and the impacts and integration of these measures and its benefits on the organisational and environmental performances.

1. Environmental factors in Supplier Selection: Just under two- fifths (46%) of the participants agreed to the assertion that environmental factors are employed pro-actively by their firms in the selection of suppliers. This implies a massive commitment to the integration of sustainableprocurement in the procurement process. However, a third (30%) however, said they disagreed or were indifferent, reflecting differences between one MNC and another in the enforcement of environmental standards. All these heterogeneities could be influenced by such factors as the size, choice of industry, or level of maturation of the company's sustainability activities.

2. Enhanced Operational Efficiency and Cost Reduction: The respondents' response to the statement that GSCM procedures have improved the operational efficiency and reduced costs for a certain segment of the participants was accordingly positive with 52%. Thus, it illustrates GSCM enhancing early aspects of operation, such as waste minimisation and resource management. However, 25% of the respondents replied 'no opinion' or disagreeing which might mean that organisations can experience challenges in realising these benefits all the time. The identified benefits may however differ based on factors such as integration intensity or early cost up-fronts.

3. Top Management Commitment: Percentages obtained showed that top management commitment was strong as ranked by 58% of the respondents showing that it is a critical factor in the implementation of GSCM processes. 35% of the respondent, however, had no opinion or disagreed with the statement suggesting that while managing commitment may vary in different MNCs. The variance in degrees of commitment might also have impact on the success of GSCM projects as it requires significant amount of leadership to counter resistance and ensure that business strategy alongside sustainability objectives are pursued.

4. Implementation Barriers: Some of the major impediments to the implementation of environment friendly supply chain ideas where revealed in the survey. Thirteen percent of the respondents said that they faced issues like cost and inadequate experience. This highlights the fact that due to these barriers, MNCs have to employ targeted strategies such as using a portion of the company's profit to train its employees, to invest on human resources, or search for a fiscal incentive or tax break for projects that would positively impact the environment.

5. Consumer Demand for Sustainable Products: The largest number of respondents (66%) responded that the consumers want environmental friendly products and processes. This shows how much customer's expectations are gaining importance in relation to GSCM implementation. The pressure from the customers along with the awareness about the health consequences of environmental degradation can still act as a motivation for the MNCs to change their existing environmental policies.

6. Brand Image and Compliance: Lastly, the participant respondents were asked on their own opinion about the impact of GSCM on their respective companies and the responses were as follows: The respondents also responded that due to implementation of GSCM principles, the environmental standard compliance and brand image of the company has got enhanced by 64%. In this study, sustainable supply chain criteria are highlighted and the benefits of achieving sustainability with references to reputation and regulation of a firm are outlined. The amount of these benefits though, may differ based on the level of GSCM maturity and market category of the organisation.

Conclusion:

The results of this research on the implementation GSCM practices by MNCs show that green activities have positive effects on the operational performance and organisational image, but also create some difficulties. The results reveal that MNCs have a clear concern in the integration of environmental concerns in the selection of suppliers and GSCM practices brought about by better operational efficiency. Nevertheless the challenges like high costs and lack of expertness remain and influence the equally efficiency of those measures. Customers' demand for environmental friendly products is one of the root causes, which compel MNCs to improve their performance standard. The engagement of top management is very vital in the implementation of GSCM, although it's not fully provided in different organization. The study also reveal that the benefits of GSCM practices include promotion of brand image and compliance to environmental standards noting that these benefits could vary in degree.

Finally, organization leaders of MNCs should effectively incorporate the following measures if the MNCs expect to capture the benefits of GSCM: the reduction of implementation barriers; increasing strategic management support; and integrating with the consumers' expectations. The above laid-down steps will increase their environmental efficiency and sustainability to market challenges.

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Exploring the Role and Impact of Vananchal Gramin Banks in Tribal Development and Empowerment

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ABSTRACT

Vananchal Gramin Banks play a crucial role in promoting tribal development and empowerment by providing essential financial services tailored to the unique needs of tribal communities. As a vital part of the rural banking system, these banks address financial exclusion by offering access to credit, savings, insurance, and other financial products to tribal populations often marginalized from mainstream economic activities. Their initiatives focus on fostering economic growth through the support of tribal entrepreneurship, agriculture, small-scale industries, and self-help groups, contributing to poverty alleviation and self-reliance. By financing educational opportunities, healthcare, and housing, Vananchal Gramin Banks also play a pivotal role in improving the overall quality of life in tribal regions. Furthermore, their emphasis on financial literacy programs helps bridge the gap between traditional lifestyles and modern financial practices, ensuring the sustainable use of resources. Despite challenges such as geographic isolation, lack of infrastructure, and cultural barriers, these banks continue to innovate through digital banking and targeted microfinance schemes to extend their reach. This paper explores the comprehensive impact of Vananchal Gramin Banks on tribal development, highlighting their contribution to economic inclusion, social upliftment, and the empowerment of marginalized tribal groups.

INTRODUCTION

Tribal communities in India have historically faced socio-economic challenges, including limited access to education, healthcare, and financial resources. These issues are further exacerbated by geographic isolation, lack of infrastructure, and cultural barriers. In this context, Vananchal Gramin Banks play a significant role in bridging the gap between these underserved communities and the mainstream economy. As regional rural banks, they are uniquely positioned to address the financial needs of tribal populations by providing accessible, affordable, and inclusive banking services. By offering tailored products such as small loans, microfinance, savings accounts, and credit for agriculture or small-scale businesses, these banks empower tribal communities to achieve economic self-sufficiency and reduce their dependence on informal credit sources. Additionally, their initiatives contribute to the overall development of tribal areas by financing critical sectors such as education, healthcare, and housing.

The impact of Vananchal Gramin Banks extends beyond financial inclusion, as they actively promote sustainable development and social upliftment. Through financial literacy campaigns, these banks educate tribal populations about modern banking practices, enabling them to make informed financial decisions. They also support self-help groups, fostering collective entrepreneurship and skill development among tribal individuals, especially women. However, despite their significant contributions, these banks face challenges such as operational constraints, low financial literacy levels, and limited connectivity in remote areas. This paper delves into the multifaceted role of Vananchal Gramin Banks in tribal development, examining their contributions, challenges, and potential strategies for enhancing their impact. By addressing these challenges and leveraging opportunities for digital innovation and public-private partnerships, Vananchal Gramin Banks can further strengthen their role as catalysts of tribal empowerment and sustainable development. Through a comprehensive analysis, this study aims to shed light on the transformative potential of these banks in uplifting marginalized tribal communities and fostering inclusive growth.

Role of Vananchal Gramin Banks

Vananchal Gramin Banks play a pivotal role in the socio-economic upliftment of tribal communities by addressing financial exclusion and promoting inclusive development. These banks serve as a crucial link between underserved tribal populations and the formal banking system, providing accessible and affordable financial services tailored to their unique needs. By offering credit for agriculture, small-scale industries, and entrepreneurship, they empower tribal individuals to pursue economic opportunities, enhance livelihoods, and reduce dependency on exploitative informal credit sources. Additionally, these banks actively support self-help groups, fostering collective entrepreneurship, skill development, and women's empowerment within tribal regions. Their financial literacy programs educate tribal populations about banking practices, enabling informed financial decision-making and encouraging a culture of savings. Beyond economic empowerment, Vananchal Gramin Banks contribute to the overall development of tribal areas by financing essential services such as education, healthcare, and housing. They also promote sustainable development by supporting eco-friendly projects and tribal crafts, preserving cultural heritage while creating income-generating opportunities. Despite challenges like remote locations, limited infrastructure, and cultural barriers, these banks continually strive to innovate through digital banking solutions and targeted microfinance initiatives, extending their reach and impact. By fostering economic inclusion, reducing poverty, and promoting social upliftment, Vananchal Gramin Banks serve as a vital catalyst for tribal empowerment and holistic development, playing an instrumental role in integrating marginalized tribal communities into the broader socioeconomic fabric.

Methodology

Research Design

A mixed method research design was employed that combined quantitate and qualitative methods to adequately address the research problem. The complexity of the topic was addressed by opting for this design, since it enabled the gathering of numerical data to test hypotheses, as well as of rich qualitative insights to place the results. Quantitative measures were obtained via a survey administered to tribal populations and bank officials who were asked to respond regarding access to banking services, satisfaction level, and perceived impact of the bank's programs. In the qualitative component, there were in depth interviews and focus group discussions which gave nuanced insights of the challenges and opportunities in tribal banking.

As a mixed method design, it was able to use the strengths of the two approaches and reduce the weaknesses of the individual approaches. Quantitative data allowed for measurement of trends and relationships and qualitative insights explained the reasons for these trends. This approach was critical to addressing the multi-dimensional research objectives and testing the hypotheses.

Population and Sampling

This study's population was tribal communities and Vananchal Gramin Bank stakeholders (employees and policymakers) in various districts were made part of the study population. Since, the tribal population being diverse in nature and also covering various geographical areas the operations of the bank required, a robust sampling technique would have to be adopted to provide representativeness.

Target Population: The target population was delimited to the communities of tribal people who were the current or potential recipient of the bank services. The secondary population was bank employees, such as managers and policy planners in the branch, to provide a bank institutional perspective on the bank's operations.

Sampling Technique: To gain proportional representation of each demographic group of different age, gender, education level, and occupation, a stratified random sampling technique was used. In addition, the respondents were stratified by geographical regions (rural, semi-urban and urban) of the tribal populations. Using this method kept the sample true to the diversity of the target population and decreased sampling bias.

Sample Size: Statistical formulas were used to make sure the sample size was big enough to have enough power for our hypothesis testing. A total of 400 respondents were (inclusively) selected; 300 tribal individuals and 100 bank stakeholders. At a confidence level of 95% and a margin of error of 5%

this size was satisfactory to use.

Study Area

The study area is the Dumka district of the eastern Indian state of Jharkhand. Dumka is Sub capital of state and predominantly a tribal dominated region with high degree of socio economic and cultural diversity. A rural and semi urban region, the district is part of Santhal Pargana division and agriculture is famous as the main means of income for people in most part of the region. Most of population consists of the Santhals, and socio-economic development of the tribal communities is a major focus of government and non-government initiatives.

As a tribal dominated district in geographic and demographic terms, Dumka constitutes an ideal site to study the role of the Vananchal Gramin Banks in tribal development. Banking services have a high financial exclusion prevalence in tribal communities in the district, making this a relevant area to assess the impact of banking services. We find that since the developmental objectives of Regional Rural banks are focused toward agriculture, minor forest produce, and small scale industries, the region's economy largely depends on these. The study was targeted on capturing the peculiarities of the banking services access by tribal populations, and the role of Vananchal Gramin Banks in overcoming them, (choosing Dumka). Dumka’s findings can contribute to in understanding of strategies for including growth and financial empowerment in similar tribal areas.

Results and Discussion

Descriptive Statistics

In a way descriptive statistics help to summarize the central tendencies, dispersion and distribution of the data collected for this research. The tabular form of descriptive statistics of the variables used in the present study to measure the extent of Vananchal Gramin Bank in tribal development is presented in this section. This correlates with the previous results as the mean and all the other measurements provide valuable insight of the data distribution and its dispersion.

Introduction to Descriptive Statistics

Descriptive statistics are basic in pointing out the details of the data and certain features of its distribution. These statistics concerns location (mean), spread (standard deviation), and shape (skewness, kurtosis). The mean gives the measure of the central tendency of a variable while the standard deviation, measures spread, measures the variability or dispersion of the values from the mean of the set, skewness measures the extent of the asymmetry of the data distribution and kurtosis depicts how much the data distribution is peaked or flat when compared to a normal distribution. Collectively these measures enable the researchers to work out patterns and outliers possibly requiring Working with data for making up inferential statistical analyses.

Table 1 Descriptive Statistics

Variables	N	Mean	Std. Deviation	Skewness	Kurtosis
Planning and Performance of Vananchal Gramin Banks	400	3.988	.825	-1.554	2.435
Impact of Bank Programs and Policies on Tribal Development	400	3.651	.790	.051	-.912
Ratio of Deposits and Loans Sanctioned and Financial Inclusion	400	3.860	.926	-1.049	1.024
Regional Imbalances in Bank Performance Across Different Branches	400	3.956	.828	-1.346	2.404
Regional Challenges and Bank Effectiveness	400	4.033	.829	-1.442	2.513
Policy Changes and Improvement in Bank Performance	400	3.717	.748	-.078	.949
Valid N (listwise)	400				

Analysis of Variables

1. **Planning and Performance of Vananchal Gramin Banks:**
   - **N:** 400
   - **Mean:** 3.988
   - **Standard Deviation:** 0.825
   - **Skewness:** -1.554
   - **Kurtosis:** 2.435

The scale averages to 3.988 thus the respondents generally had a positive perception about the planning and performance of the Vananchal Gramin Banks and their performance was near the 'agree' value based on Likert scale. This has a standard deviation of 0.825 which is still relatively high showing that there was variation in the response received. The negative skewness (-1.554) highlights a left-tailed distribution, suggesting that most respondents provided higher ratings, indicating favorable perceptions of the bank's planning and performance. The kurtosis value (2.435) exceeds 0, indicating a leptokurtic distribution, which is more peaked than a normal distribution.

2. **Impact of Bank Programs and Policies on Tribal Development:**
   - **N:** 400
   - **Mean:** 3.651
   - **Standard Deviation:** 0.790
   - **Skewness:** 0.051
   - **Kurtosis:** -0.912

With a mean of 3.651, respondents moderately agreed that the bank's programs and policies positively impacted tribal development. The standard deviation of 0.790 shows low variability, suggesting consistency in responses. The skewness value (0.051) is close to zero, indicating a nearly symmetric distribution. However, the kurtosis value (-0.912) suggests a platykurtic distribution, characterized by a flatter peak compared to a normal distribution.

3. **Ratio of Deposits and Loans Sanctioned and Financial Inclusion:**
   - **N:** 400
   - **Mean:** 3.860
   - **Standard Deviation:** 0.926
   - **Skewness:** -1.049
   - **Kurtosis:** 1.024

The mean of 3.860 reflects positive perceptions of the deposit-loan ratio's role in promoting financial inclusion. The standard deviation of 0.926 indicates moderate variability in responses. A negative skewness value (-1.049) indicates a left-tailed distribution, with more respondents leaning towards higher ratings. The kurtosis value (1.024) shows a leptokurtic distribution, suggesting a more peaked curve compared to normal.

4. **Regional Imbalances in Bank Performance Across Different Branches:**
   - **N:** 400
   - **Mean:** 3.956
   - **Standard Deviation:** 0.828
   - **Skewness:** -1.346
   - **Kurtosis:** 2.404

A mean of 3.956 suggests that respondents agreed that regional imbalances are evident in the bank's performance across different branches. The standard deviation of 0.828 indicates moderate dispersion of responses. Negative skewness (-1.346) reveals that a significant number of respondents rated the imbalances more severely, while a kurtosis value of 2.404 reflects a leptokurtic distribution with a pronounced peak.

5. **Regional Challenges and Bank Effectiveness:**
   - **N:** 400
   - **Mean:** 4.033
   - **Standard Deviation:** 0.829
   - **Skewness:** -1.442

With a mean of 4.033, this variable received the highest agreement level among all, indicating strong recognition of regional challenges as significant barriers to the bank's effectiveness. The standard deviation of 0.829 suggests moderate variability. The negative skewness (-1.442) reflects a distribution skewed towards higher ratings, and the kurtosis value (2.513) shows a leptokurtic distribution, signifying a sharp peak.

6. **Policy Changes and Improvement in Bank Performance:**
   - **N:** 400
   - **Mean:** 3.717
   - **Standard Deviation:** 0.748
   - **Skewness:** -0.078
   - **Kurtosis:** 0.949

The mean score of 3.717 indicates that respondents moderately agreed with the positive impact of policy changes on bank performance. The standard deviation of 0.748 reflects relatively low variability in responses. A skewness value of -0.078 shows a nearly symmetric distribution, and the kurtosis value (0.949) suggests a distribution slightly peaked but close to normal.

Summary and Implications

The descriptive statistics provide valuable insights into respondents' perceptions of the bank's operations and impact. The overall high mean values across variables indicate a generally positive evaluation of Vananchal Gramin Bank's role in tribal development. However, the variability and distribution characteristics highlight areas requiring further attention:

Strong Perceptions of Challenges: The high mean for regional challenges and bank effectiveness emphasizes the need for targeted infrastructural and logistical improvements.

Positive Impact of Policy Changes: Moderate agreement on policy changes suggests room for further refinement and implementation to achieve optimal outcomes.

Imbalances in Performance: The acknowledgment of the regional disparities dictates that development needs to be addressed in a regional manner.

Information presented in these tables helps the study to reveal the key areas of the bank strength and inefficiency and contribute to the further development of the course of action. The conclusions stress the necessity of the constant control and the availability of flexible policies and higher funds to eliminate existing gaps and achieve desirable development in the tribal areas.

Hypothesis Testing

1. Hypothesis 1: There is a significant relationship between the planning and performance of Vananchal Gramin Banks and the economic development of tribal areas.

Null Hypothesis (H01): There is no significant relationship between the planning and performance of Vananchal Gramin Banks and the economic development of tribal areas.

Alternate Hypothesis (Ha1): There is a significant relationship between the planning and performance of Vananchal Gramin Banks and the economic development of tribal areas.

Correlation Analysis

Here is the correlation data represented as a table:

Table 2 Correlation Analysis

Variables	Planning & Performance	Economic Development
Planning & Performance	1.00	0.078
Economic Development	0.078	1.00

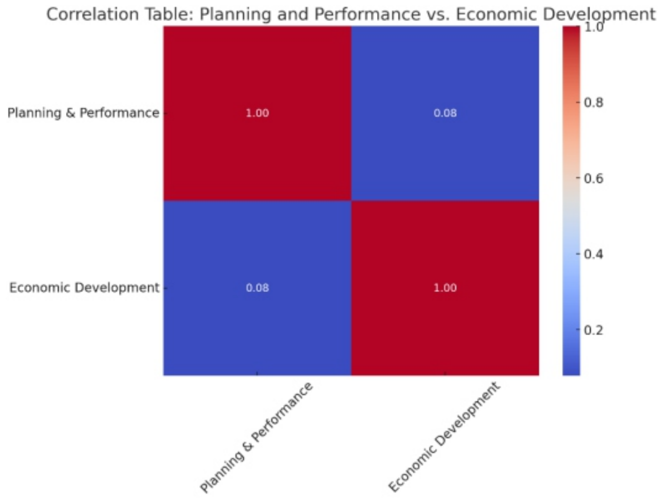

Fig 1 Correlation Analysis

Interpretation

The Pearson correlation coefficient (r = 0.078) indicates a weak positive relationship between the planning and performance of Vananchal Gramin Bank and the economic development of tribal areas. However, the p-value (0.119) is greater than the typical significance level (0.05), suggesting that this relationship is not statistically significant.

This result leads us to fail to reject the null hypothesis (H01): There is no significant relationship between the planning and performance of Vananchal Gramin Bank and the economic development of tribal areas.

2. Hypothesis 2: Changes in the programs and policies of the Vananchal Gramin Bank have positively impacted the development of tribal areas.

Null Hypothesis (H02): Changes in the programs and policies of the Vananchal Gramin Bank have not significantly impacted the development of tribal areas.

Alternate Hypothesis (Ha2): Changes in the programs and policies of the Vananchal Gramin Bank have significantly impacted the development of tribal areas.

Test Results

Test Metric	Value
Test Type	Wilcoxon Signed-Rank Test
Test Statistic	23,571.5
P-Value	0.466
Significance Level	0.05
Conclusion	Fail to Reject H02

Interpretation

The Wilcoxon Signed-Rank Test statistic is 23,571.5, with a p-value of 0.466.
Since the p-value is greater than the significance level of 0.05, we fail to reject the null hypothesis (H02).
The analysis suggests that there is no statistically significant difference between the pre- and post intervention scores.
This indicates that changes in the programs and policies of the Vananchal Gramin Bank have not had a measurable impact on the development of tribal areas based on the available data.

3. Hypothesis 3: A positive relationship exists between the ratio of deposits and loans sanctioned by Vananchal Gramin Bank and the growth of financial inclusion in tribal regions.

Null Hypothesis (H03): There is no significant relationship between the ratio of deposits and loans sanctioned by Vananchal Gramin Bank and the growth of financial inclusion in tribal regions.

Alternate Hypothesis (Ha3): There is a significant positive relationship between the ratio of deposits and loans sanctioned by Vananchal Gramin Bank and the growth of financial inclusion in tribal regions.

Results for Hypothesis 3:

Table 3 Test Metrics Table

Metric	Value
Pearson Correlation Coefficient	0.891
P-Value	0.000
Regression Coefficient	1.0149
Intercept	-0.0072

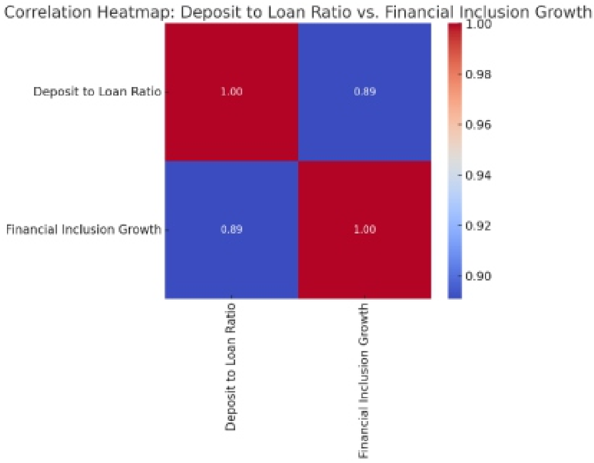

Figure 2 Test Metrics Table

Interpretation

The Pearson Correlation Coefficient is 0.891, indicating a very strong positive relationship between the ratio of deposits to loans and financial inclusion growth.

The p-value (0.00 is far below the typical significance level (0.05), confirming the relationship is statistically significant.

The regression coefficient is 1.0149, suggesting that for every unit increase in the deposit-to-loan ratio, financial inclusion grows by approximately 1.015 units.

The intercept is -0.0072, indicating that even at a zero deposit-to-loan ratio, financial inclusion starts at a slightly negative baseline (practically negligible).

The results provide strong evidence to reject the null hypothesis (H03) and accept the alternate hypothesis (Ha3): There is a significant positive relationship between the ratio of deposits and loans sanctioned by Vananchal Gramin Bank and the growth of financial inclusion in tribal regions.

Conclusion

Vananchal Gramin Banks have emerged as a cornerstone for fostering tribal development and empowerment, addressing the financial and socio-economic challenges faced by tribal By providing tailored financial services, such as credit, savings, and insurance, these banks have empowered tribal populations to participate in mainstream economic activities, fostering self-reliance and reducing poverty. Their initiatives in supporting agriculture, small-scale industries, and self-help groups have not only enhanced livelihoods but also promoted entrepreneurship and collective economic growth. Additionally, their focus on financial literacy and education has bridged the knowledge gap, enabling tribal individuals to make informed financial decisions and integrate seamlessly with modern financial systems. Beyond economic empowerment, these banks have contributed to improving the quality of life by financing education, healthcare, and housing, laying the foundation for sustainable development. Despite challenges such as remote locations, infrastructure constraints, and cultural barriers, Vananchal Gramin Banks have leveraged innovative approaches, including digital banking and microfinance schemes, to extend their impact. Their role in preserving tribal heritage while creating incomegenerating opportunities underscores their commitment to holistic development. Moving forward, strengthening public-private partnerships, expanding digital infrastructure, and addressing operational constraints can further enhance their effectiveness. Vananchal Gramin Banks remain instrumental in transforming tribal communities and fostering inclusive growth in India's socioeconomic landscape.

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Delhi Metro and Digital India: Driving the Transition to a Cashless Future

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ABSTRACT

The transition to a cashless future in Mass Rapid Transit Systems (MRTS) is a key part of the global shift towards digitalization and cashless economies. This article explores the role of Delhi Metro in leading this transition, positioning it as a leader in the adoption of digital payment technologies in public transportation. As part of India's Digital India initiative, Delhi Metro has integrated various digital payment methods, including smart cards, mobile payments, QR code scanning, and contactless systems, to improve convenience for commuters, lower operational costs, and enhance the overall travel experience. The study examines the technological innovations, government policies, and operational strategies that have driven the success of cashless transactions in Delhi Metro. It also evaluates the broader implications for urban mobility, financial inclusion, and sustainability. The study further highlights the challenges in implementing seamless digital payment integration and considers the potential for scaling these systems. Overall, the study emphasizes how Delhi Metro contributes to India's digital economy and aligns with the goals of the Digital India campaign.

Keywords: *Delhi Metro, Digital India, Cashless Transactions, Smart Cards, Digital Payments, Urban Mobility, Financial Inclusion, Sustainable Transport.*

1. Introduction

The Digital India initiative, launched by the Government of India in 2015, envisions the transformation of India into a digitally empowered society (Government of India, 2015). A key component of this vision is the promotion of cashless transactions and the development of digital infrastructures that improve accessibility and convenience for citizens. Public transportation, particularly Mass Rapid Transit Systems (MRTS), plays a pivotal role in this transition by integrating digital payment systems to enhance efficiency and reduce operational costs (Singh, 2020). Among the leading examples of this transition is Delhi Metro, one of the largest and most technologically advanced metro networks in the world. Delhi Metro has adopted various digital payment solutions such as smart cards, mobile payments, QR code scanning, and contactless payment systems, significantly enhancing the commuter experience while also contributing to India's broader financial inclusion goals (Patel & Gupta, 2019). These initiatives align with the objectives of the Digital India mission, which aims to empower citizens through digital infrastructure and promote cashless transactions across diverse sectors, including transportation (NITI Aayog, 2021).

This article explores how Delhi Metro is playing a leading role in India's transition towards a cashless future by examining the technological infrastructure and digital payment methods it has implemented to facilitate secure and seamless transactions for passengers. The study also considers the wider implications of this digital shift, including its potential to contribute to sustainability, financial inclusion, and the overall digital economy (Kumar, 2022).

Additionally, the article addresses the challenges faced in the adoption of digital payment systems, including technological limitations, security concerns, and the need for public awareness (Raghavan, 2020). Through this analysis, the article provides insights into how Delhi Metro and other MRTS systems, shaping the future of urban mobility and advancing India's cashless economy.

2. Delhi Metro and its Role in Urban Mobility

2.1. The Evolution of Delhi Metro : The journey of the Delhi Metro is a remarkable story of vision, innovation, and perseverance. Initiated in the late 20th century to tackle the increasing urban transport issues in India's capital, Delhi Metro has transformed into one of the most effective and growing metro networks globally. Although the concept of a mass rapid transit system for India's Capital was initially proposed in the 1960s, but it was only in 1995 that Delhi Metro Rail Corporation (DMRC) was established to turn this vision into reality. In 1998, the metro system's construction began in earnest, supported by the Government of India and international expertise from countries including Japan. The first section of Delhi Metro was officially opened in December 2002, from Shahdara to Tis hazari serving as a reliable alternative to Delhi's chaotic road traffic. The system has since undergone rapid expansion, with subsequent phases introducing innovations such as driverless trains, regenerative braking technology, and integrated ticketing systems.

As of 2024, the network extends over 390 kilometers, connecting Delhi with satellite cities such as Gurgaon, Noida, Faridabad, and Ghaziabad. The growth of Delhi Metro is distinguished by its dedication to sustainability and modernization. It is the first railway project in the world to obtain carbon credits for its reduction of greenhouse gas emissions and has successfully integrated solar energy and green building practices into its design. The introduction of cashless payment methods, including smart cards, QR-based ticketing, and mobile wallet options, has further improved the commuting experience. Delhi Metro has not only transformed urban transportation but has also set a high standard for public transit in India. Its success has inspired similar metro initiatives in cities like Mumbai, Bangalore, and Kolkata, making it a vital component of India's advancement towards efficient, sustainable, and modern urban transit solutions.

2.2. Driving Cashless Mobility: Digital Payments in Public Transport : In response to India's increasing emphasis on digitalization, DMRC has initiated a transition to a cashless metro system as part of its comprehensive strategy to enhance service modernization. This shift to digital payment methods not only supports the government's goal of establishing a cashless economy but also mitigates operational issues associated with manual fare collection, delays at ticket counters, and the expenses linked to cash handling. To align with the Digital India initiative and modernize urban transit, Delhi Metro has introduced various cashless payment solutions, such as smart cards, mobile wallet integrations, QR-code ticketing, and contactless NFC payments. These advancements improve commuter convenience by minimizing wait times at ticket counters and enhance transparency and efficiency of financial transactions. Collaborating with platforms like Paytm, PhonePe, and UPI, Delhi Metro has made digital payment options readily available to millions of daily users. Additionally, incentives such as discounts for smart card usage and app-based transactions have further promoted these transitions. This move towards digital payments has established Delhi Metro as a benchmark for urban transit systems, demonstrating how technology can transform public transportation while supporting a cashless economy.

3. Digital India Initiative: The Vision and Policies

The Digital India Initiative, introduced by the Government of India in July 2015, is a groundbreaking effort designed to transform the nation’s digital landscape. Its goal is to establish a digitally empowered society and a knowledge driven economy by utilizing technology to address issues of accessibility, efficiency, and inclusivity. The initiative emphasizes improving public service delivery, advancing digital literacy, and encouraging innovation across multiple sectors.

3.1. Key Pillars of Digital India : The Digital India initiative is built upon three core pillars: 1. Digital Infrastructure as a Utility for All: Providing universal access to digital services and infrastructure. 2. Governance and Services on Demand: Enabling the digital provision of services to the public. 3. Digital Empowerment of Citizens: Promoting digital literacy and access to online services.

In the context of urban mobility, the Digital India program aspires to create secure, accessible, and inclusive digital payment ecosystems, ensuring that citizens can access essential services such as transportation without the necessity of physical cash.

3.2. Government Policies Supporting Cashless Payments : Various government initiatives, including National Payments Corporation of India (NPCI) and Pradhan Mantri Jan Dhan Yojana (PMJDY), have established a strong foundation for the advancement of digital payment systems nationwide. Demonetization of 2016 served as a crucial impetus for the shift towards cashless transactions, while programs such as Bharat Interface for Money (BHIM) have facilitated widespread adoption in multiple sectors, particularly in public transportation.

4. Key Digital Payment Systems in Delhi Metro

Delhi Metro has been a pioneer in adopting digital payment systems to enhance commuter convenience, improve operational efficiency, and align with India's broader goal of creating a cashless economy under the Digital India initiative. These systems are designed to simplify transactions, reduce reliance on cash, and offer a seamless commuting experience to millions of daily passengers. Here are the key digital payment systems implemented in the Delhi Metro:

4.1. Delhi Metro Smart Card : The introduction of the Delhi Metro Smart Card was a major step towards cashless payments in public transport. Launched in 2006, the Metro Smart Card allows commuters to load money onto a reusable card, which can then be used to access metro stations and services. The card eliminates the need for physical cash and paper tickets, providing a quicker, safer, and more efficient mode of fare collection.

Features:

o Prepaid, Rechargeable cards allow commuters to travel without purchasing tickets for each journey.

o Users can top up their cards through various channels, including ticket counters, kiosks, mobile apps, and websites.

o Offers a 10% discount on fares, incentivizing adoption.

Impact: Over 70% of commuters use smart cards, reducing queues and improving operational efficiency.

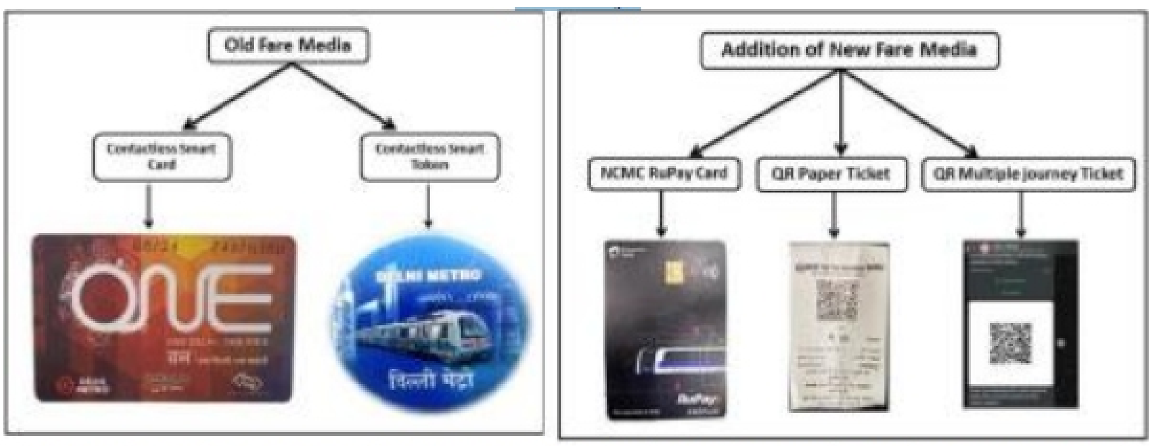

Figure-1: Various Fare media used by commuters in Delhi Metro for the journey purpose

4.2. Mobile-Based Payments and App Integration : In line with technological advancements, Delhi Metro has introduced mobile-based payments via the DMRC mobile app. Delhi Metro has partnered with popular mobile wallets such as Paytm, PhonePe, and Google Pay to facilitate ticket bookings and smart card recharges. Commuters can now purchase tickets using their smartphones, with options for QR codebased ticketing and contactless payments through popular wallet services.

How It Works:

o Passengers generate a QR code on their mobile phones after booking tickets via the official Delhi Metro app or partnered apps like Paytm.

o The QR code is scanned at designated gates for access.

o Enables commuters to recharge their smart cards or purchase tickets directly from their mobile wallet accounts.

o Upon purchase users get cashback offers and discounts through these platforms.

Impact:

o Eliminates the need for physical tokens.

o Promotes contactless transactions, which gained popularity during the COVID-19 pandemic. o Increases digital payment adoption among tech-savvy commuters and simplifies transactions. o The main economic savings from reducing the engagement of manpower come from lower labor costs,

fewer employee-related expenses (such as benefits, insurance, and training), and the potential for more efficient processes and operations. While the initial investment in technology or automation may be high, the long-term savings often outweigh these costs, making businesses more competitive and profitable.

4.3. NFC and Contactless Ticketing Systems : DMRC has gradually moved towards implementing contactless payment systems using Near Field Communication (NFC) technology. Commuters can use their personalized contactless debit/credit cards or smartphones with NFC capabilities to tap and board the metro, substituting traditional methods like paper tickets or physical smart cards.

How it Works:

o Passengers tap their NFC-enabled device or card on the gate reader to make payments automatically.

Benefits:

o Speed and Efficiency: Instantaneous fare deductions, reducing wait times.
o Increased Security: Reduces the need for physical ticket handling, lowering the risk of fraud. o Offers a frictionless, fast, and secure payment method.
o Reduces dependence on physical cards and tokens.

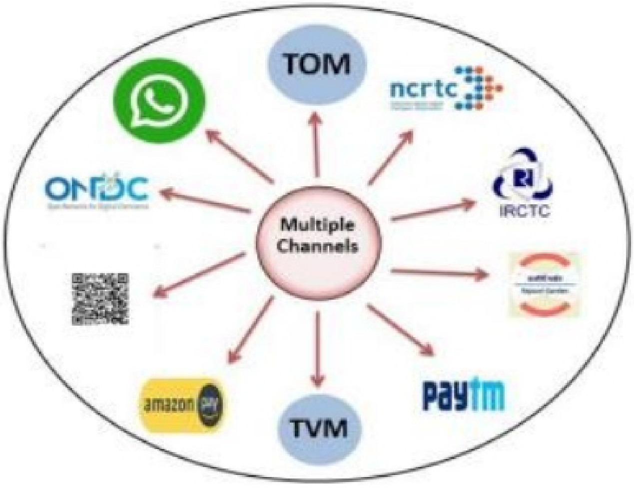

Figure-2: Various methods to generate the QR Ticket for the journey purpose by commuters.

4.4. Integration with National Digital Payment Systems : Delhi Metro has embraced digital payment systems like RuPay Cards and the National Common Mobility Card (NCMC) to provide seamless, cashless travel experiences across public transport. By integrating with NPCI's National Electronic Toll Collection (NETC), DMRC ensures a unified payment system for various transit modes. The NCMC, launched under the Digital India initiative, allows passengers to use a single card for transportation and retail transactions. As one of the first adopters of NCMC, Delhi Metro initially introduced it on the Airport Express Line, with its usage now expanded to other lines, supported by upgraded infrastructure.

How It Works:

o Commuters can use the NCMC card to tap on AFC gates for seamless entry and exit. o Fares are automatically deducted from the card balance without the need for physical tokens or tickets.

Benefits in Delhi Metro:

o Supports quick and hassle-free ticketing, reducing queues and congestion at ticket counters. o Offers flexibility to commuters as the card can also be used for buses, parking, and retail.

5. Benefits of a Cashless Metro System

5.1. Operational Efficiency and Cost Savings : The transition to a cashless payment system has significantly improved the operational efficiency of the Delhi Metro. Reduced reliance on cash handling means less time spent on manual fare collection and fewer costs associated with human resource engagement, printing tickets and maintaining cash infrastructure.

Reduced Queues and Faster Transactions: Cashless systems streamline passenger movement by eliminating the need for cash-based ticket purchases, resulting in shorter queues and faster transactions (Rahul & Shankar, 2020).

Seamless Travel: They enable seamless integration with other transportation modes, offering a unified travel experience (Gupta, Sharma, & Verma, 2019).

24/7 Access: Passengers can top-up balances or purchase tickets online at any time, eliminating dependency on manned ticket counters or machines (World Bank, 2021).

Reduced Operational Costs: Digital payments allow for faster fare collection and reduce the operational costs associated with cash handling.

5.2. Enhanced Passenger Experience: A cashless metro system offers a faster, more convenient travel experience. Commuters can avoid waiting in long queues, enjoy seamless transactions, and experience greater flexibility in payment methods. Digital payment methods also provide real-time transaction data, helping passengers keep track of their journeys.

Digital systems provide real-time information, such as balance inquiries and travel history, through integrated apps (OECD, 2020).

Loyalty programs and discounts can be easily implemented to encourage consistent ridership (Gupta, Sharma, & Verma, 2019).

5.3. Financial Inclusion: DMRC promotes financial inclusion by offering smart cards and mobile payment options, creating a cashless metro system accessible to all, including those without bank accounts. Prepaid cards, QR codes, and mobile wallets make metro travel affordable and convenient for economically disadvantaged groups. Cashless systems also enhance digital literacy and help users build a financial history, potentially linking them to services like credit and savings. Flexible "pay-as-you-go" models allow commuters to recharge with small amounts, accommodating their financial capacity. To ensure these advancements benefit everyone, metro systems can combine cashless technologies with outreach programs and affordable infrastructure.

5.4. Environmental Sustainability: Cashless transactions in metro systems promote environmental sustainability by reducing paper waste and the need for physical tickets and receipts (Rahul & Shankar, 2020). This shift eliminates the environmental impact of producing and disposing of paper-based materials (OECD, 2020). Digital payment systems also reduce the need for energy-intensive ticket machines and counters, cutting down on maintenance-related energy use (Gupta, Sharma, & Verma, 2019). Additionally, cashless systems boost efficiency, lowering the carbon footprint of metro operations through better resource management and reduced energy consumption. By encouraging digital payments, commuters are more likely to adopt eco-friendly transportation habits, supporting global sustainability goals and creating greener urban mobility (World Bank, 2021).

6. Challenges in the Transition to a Cashless Future

6.1. Digital Literacy and Accessibility: While digitalization is advancing rapidly, many people still face barriers that prevent them from using digital technologies. Challenges like low digital literacy—such as the inability to operate smartphones or use apps—and limited access to devices and reliable internet are major obstacles. Vulnerable groups, including the elderly, low-income individuals, and rural residents, are particularly affected due to limited resources, education, or exposure to digital platforms (Gupta, Sharma, & Verma, 2019). Adapting to cashless systems is difficult for these groups, requiring solutions such as digital literacy programs, affordable access to technology, and simple, user-friendly systems. Without these efforts, many people may be excluded from the benefits of digital transformation, undermining its success. To ensure inclusivity, coordinated initiatives are essential to close these gaps and make technology accessible for everyone.

6.2. Security and Data Privacy Concerns: Ensuring cyber security and data privacy is essential for building trust and encouraging the adoption of digital payment systems. These systems require the collection of sensitive personal and financial information, such as names, addresses, and transaction histories, which can be targeted by cyber threats like hacking and phishing. Without strong security measures, public confidence may decline, discouraging the use of cashless payments (Rahul & Shankar, 2020).

To address these risks, advanced security measures like end-to-end encryption, multi-factor authentication, and real time monitoring for suspicious activities are critical. Clear communication about data protection measures and educating users on safe digital practices further enhance trust.

. Raising awareness about cyber security among commuters also helps reduce vulnerabilities. By prioritizing these actions, digital payment systems can offer a secure and reliable platform, encouraging widespread adoption and ensuring the longterm success of cashless metro systems.

6.3. Infrastructure and Technological Integration: Integrating diverse digital payment platforms with metro systems requires advanced technology and robust infrastructure. Seamless connectivity between different payment methods relies on interoperability standards that enable smooth communication across digital wallets, banking apps, and contactless cards. For DMRC, this means regular upgrades to software and hardware to support new technologies. Managing multiple systems is challenging, as maintaining compatibility and addressing technical glitches like failed transactions or delays can impact commuter trust and satisfaction (Gupta, Sharma, and Verma, 2019). To overcome these issues, DMRC is making continuous investment in IT infrastructure, collaborations with payment providers, and rigorous testing to ensure reliability. Establishing interoperability allows commuters to use their preferred payment methods without barriers, improving convenience and satisfaction. By prioritizing these steps, DMRC can enhance operations and ensure the success of its cashless metro system.

7. Future Prospects: Scaling Digital Payments in Delhi Metro

7.1. Expansion of Contactless Payment Systems: The introduction of contactless payment systems in Delhi Metro has transformed commuting, aligning with global trends in digital transportation. Technologies like RuPay cards and the National Common Mobility Card (NCMC) allow passengers to tap their cards at fare gates for seamless travel (Gupta, Sharma, & Verma, 2019). The NCMC, part of the Digital India initiative, offers a versatile payment solution, usable for metro travel, buses, parking, and retail transactions (World Bank, 2021). On integration with the National Payments Corporation of India's (NPCI) National Electronic Toll Collection (NETC), DMRC ensures compatibility across various transit modes, simplifying fare collection and boosting efficiency (OECD, 2020). This shift positions Delhi Metro as a leader in adopting smart, contactless technologies, enhancing commuter convenience and promoting digital inclusion.

7.2. Integration with Other Forms of Public Transport : Delhi Metro has successfully integrated with other public transport systems to provide a seamless and unified commuting experience. With the NCMC, commuters can use a single card for various transit modes, including buses, suburban trains, and parking, eliminating the need for multiple payment methods. This integration is powered by the National Payments Corporation of India's (NPCI) interoperable payment ecosystem, which links metro services with other urban and regional transport systems. Delhi Metro has also integrated its operations with the city's bus network, improving connectivity and optimizing schedules for last-mile travel. Interoperable fare collection systems have reduced congestion at transfer points, making commuter more efficient and convenient. Initiatives such as shared mobility options and widespread use of smart cards has further enhanced connectivity. By aligning with smart city objectives, DMRC's integrated approach promotes sustainable urban mobility and a more accessible, efficient public transportation network.

7.3. Adoption of Blockchain and AI: The adoption of emerging technologies like Blockchain and Artificial Intelligence (AI) in metro systems, including Delhi Metro, is revolutionizing Operations, Security, and Commuter experience. Blockchain technology ensures secure, transparent ticketing and payment processes by creating decentralized, tamper-proof databases (OECD, 2020). It also facilitates efficient management of commuter data, asset tracking, and system maintenance through its immutable ledger.

The shift towards AI in metro operations is transforming how these systems are managed, making them safer, more efficient, and more passenger-friendly. AI algorithms analyze commuter flow to adjust train schedules and minimize congestion during peak hours (Gupta, Sharma, & Verma, 2019). Predictive maintenance systems powered by AI monitor equipment health, predict failures, and schedule timely repairs, reducing downtime and costs (Rahul & Shankar, 2020). Additionally, AI-driven catboats and multilingual customer service platforms enhance user engagement by providing real-time assistance and personalized recommendations.

By integrating Blockchain and AI, Delhi Metro is gradually improving operational efficiency, enhancing security, and elevating commuter experience. These innovations support the development of a smart, sustainable public transport system, affirming Delhi Metro's leadership in modern urban mobility.

8. Cashless Transactions in Delhi Metro System

Figure-3 represents the year-wise total amount/percentage share of Cash and Cashless transactions (DMRC Annual Reports), based on this data we plot a bar graph in Figure-4.

Financial Year Wise Cash/Cashless Share in Per day Average Earning (In Rs.)							
Earning Heads		2021-22		2022-23		2023-24	
Cashless Earning	HDFC POS	5187381	11.48%	7956986	9.46%	7052162	7.12%
	POS & UPI at TVMs	205322	0.45%	495115	0.59%	2426200	2.45%
	RCTM POS	18906	0.04%	31466	0.04%	32618	0.03%
	Bharat QR code & UPI at TOM/CCC	373926	0.83%	950866	1.13%	6514887	6.58%
	SCVM POS	1672	0.004%	3833	0.005%	3731	0.004%
	AVM	10620593	23.51%	21565356	25.63%	24444795	24.70%
	Auto Top-up	95831	0.21%	136579	0.16%	91971	0.09%
	Surcharge HHT Purse	74854	0.17%	150489	0.18%	254234	0.26%
	Mobile QR	0	0.00%	0	0.00%	2198964	2.22%
	NCMC Exit	0	0.00%	0	0.00%	997448	1.01%
	MJQRT	0	0.00%	0	0.00%	0	0.00%
Cashless Earning		**16578485**	**36.69%**	**31290690**	**37.18%**	**44017009**	**44.47%**
Cash Earning		28602534	63.31%	52859822	62.82%	54963546	55.53%
Total Earning		**45181018**	**100.00%**	**84150512**	**100.00%**	**98980555**	**100.00%**

Figure-3: Per Day Average Earning Data of Delhi Metro.

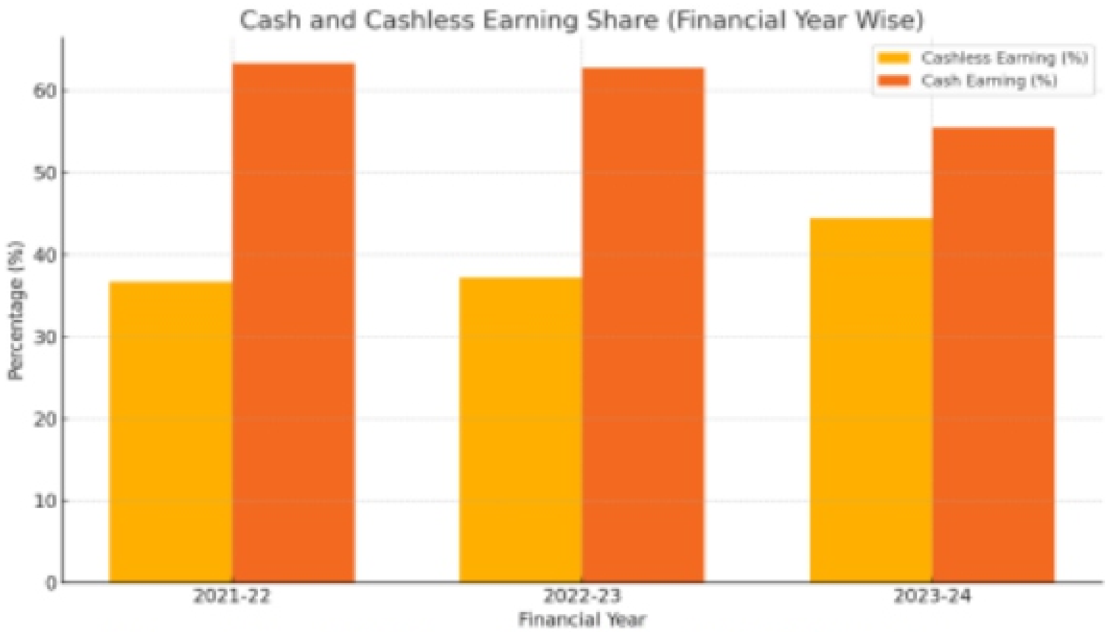

Figure-4: Transition from cash to cashless in Delhi Metro System.

Key Observations:

In 2021-22, Cash transactions dominate with over 60% of the total share, while Cashless accounts for about 35%.

A similar trend is observed in 2022-23, where Cash still holds a significant share but with a slight reduction compared to the previous year.

By 2023-24, the Cashless Share increases noticeably to around 45%, while Cash transactions drop to approximately 55%, indicating a shift towards cashless methods over the years

The trends shows in Figure-4 indicate a clear shift from cash to cashless transactions over the observed period. Digital payments grew steadily, eventually overtaking cash payments in 2024–25.

Key Drivers of Growth in Cashless Transactions:

Increased adoption of digital payment technologies such as UPI, smart cards, and QR-based ticketing. Efforts to align with initiatives like Digital India, aimed at promoting cashless systems. Improved infrastructure and user awareness campaigns for digital literacy.

Decline in Cash Usage: The consistent decline in cash usage suggests increasing user trust and convenience with cashless options, as well as institutional efforts to reduce cash dependency.

The data highlights the success of digital payment adoption and underscores the need to further invest in digital infrastructure, education, and security. If the trend observed in Figure-4 continues, cash transactions may reduce further, and digital payments could dominate the majority of transactions in coming years. We also plot an extrapolated bar graph from 2021-2030, based on data given in Figure-3 of cash and cashless earning.

Figure-5: Extrapolated bar graph for the cash vs. cashless earning of Delhi Metro (2021-2030)

Key Observations:

2021-2023 (Actual Data):

o Cash dominated the total share with over 60% in 2021-22 and 2022-23.

o However, Cashless Share showed a significant increase, reaching 44.47% in 2023-24.

2024-2030 (Extrapolated Data):

o The Cashless Share is projected to continue growing steadily, possibly exceeding 50% by 2027-2028.

o Conversely, the Cash Share is expected to decline, dropping below 50% by 2027-2028.

Long-Term Trend:

o This graph reflects a shift towards cashless transactions, with Cashless Share gradually approaching parity or surpassing Cash Share by 2030.

The graph illustrates a clear trend of digital adoption, driven by increasing preference for cashless payment methods. The decline in cash transactions and the steady rise in cashless transactions signify a transformation in consumer behavior and financial ecosystems.

9. Conclusion

Delhi Metro's adoption of digital payment technologies reflects its commitment to the Digital India vision, fostering inclusivity, efficiency, and digital empowerment. With innovations like smart cards, QR-based payments, UPI, and the National Common Mobility Card (NCMC), it has become a benchmark for modern urban transit. These technologies improve commuter convenience, streamline operations, and support the growth of a cashless economy and financial inclusion. While challenges such as digital literacy gaps and cyber security risks remain, Delhi Metro's proactive infrastructure upgrades and efforts to promote digital adoption demonstrate the transformative potential of cashless systems. By addressing these issues and building trust, it has set an example for other urban transit systems, showcasing how technology can shape a digitally empowered future. As cities grow and transportation needs evolve, Delhi Metro's initiatives underscore the crucial role of cashless systems in shaping mobility. Its success serves as a scalable and inclusive model, advancing India's vision of a connected and digitally inclusive society.

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WORLD EXPERIENCE IN E-COMMERCE TAXATION

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A B S T R A C T

This article discusses the global experience of e-commerce taxation, as well as the approaches developed in the process of its formation. At the same time, general principles and recommendations developed by international e-commerce taxation organizations were studied, as well as national tax legislation developed in a number of developed and developing countries. The study also covered the taxation of e-commerce in some CIS countries. The importance of taxes in the development of e-commerce was revealed and justified. In modern conditions of economic development, the need to develop and apply a separate effective tax mechanism, taking into account the characteristics of rapidly developing e-commerce, has been identified.

Keywords: *e-commerce, e-commerce entities, e-commerce taxation, tax administration, national tax system, tax jurisdiction, national tax jurisdictions, international taxation, double -taxation, double taxation elimination mechanism*

INTRODUCTION

Today's rapid development of the e-commerce sector requires solving long-standing and pressing problems faced by some countries, in particular Uzbekistan. It is important to emphasize that when developing and implementing measures to create an effective taxation mechanism in Uzbekistan, it is necessary to carefully study international experience in this field of activity.

There are different approaches to e-commerce taxation around the world. A number of international organizations, in particular such as the Organization for Economic Co-operation and Development (OECD), the UN Commission on International Trade Law, the Conference on Trade and Development, as well as the European Commission, have conducted research in the field of electronic commerce and coordination of its taxation and on this basis, developed general rules and gave recommendations for their practical application. Although the recommendations of international organizations are similar, they note a unilateral approach based on the priority interests of these organizations.

Thus, the international organization OECD has developed basic principles for the taxation of e-commerce, the main idea of which is that the tax burden on e-commerce taxation should not be as high as in other areas, and the tax administration process should not be complicated.

According to the data illustrated in Fig. 1, countries that are leaders in the field of modern information technologies and have a significant share of exports of digital products are supporters of providing certain privileges and preferences, maintaining the current order in the taxation of e-commerce, in contrast to states importing digital products in order to prevent budgetary losses, attempting to eliminate gaps in the taxation of e-commerce, seeking to coordinate electronic economic relations as much as possible in terms of budgetary and tax interests, in particular regarding their registration and payment of taxes.

This is another area that has emerged in the taxation of e-commerce in the world, directly related to the policies of a number of states. Of course, in this regard, each country chooses the most optimal path for itself. We consider it advisable to study the processes listed above using the example of individual countries.

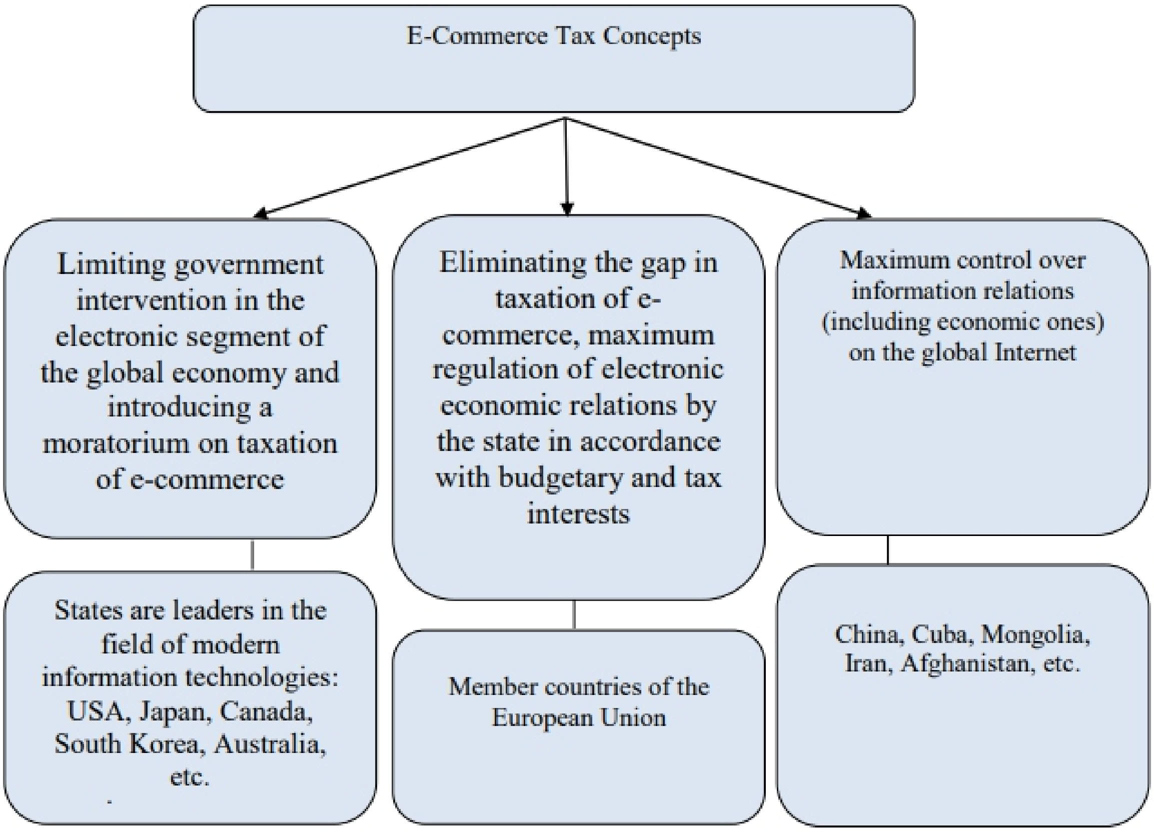

Fig.1. E-Commerce Tax Concepts[1]

The European Union has developed a special approach to the taxation of e-commerce entities, which is based on the following principles that correspond to the developments of the international organization OECD:

-no need for new taxes to tax e-commerce (value added tax is sufficient);
- taxation of electronic products as services, not goods;
- consumption tax should be levied at the place of consumption, etc.
Based on this approach, significant changes have been made to the taxation of e-commerce in Europe. In particular, it has been determined that VAT in e-commerce is subject to VAT in the European Union country where the purchase was made.

The efforts of a number of EU countries (France, Switzerland, Germany) to create a mechanism for identifying e-commerce entities engaged in illegal business activities are noteworthy. Thus, on the website of a legal entrepreneur there is a unique identification number that allows the consumer to check whether the e-commerce entity is registered with the tax authorities. By purchasing goods from these entrepreneurs, the state guarantees the rights and protection of consumers. Naturally, netizens prefer to make purchases from companies that have this "identification" number.

The introduction of a system of large fines for carrying out illegal business activities on the Internet is another area of practice in the European Union (in Germany, Spain, Italy). For example, entrepreneurs may attempt to evade taxes due to the complexity of managing their business on the global Internet, however, according to tax authorities, high fines (up to confiscation of all company property) can lead to a reduction in the number of organizations illegally operating on the Internet.

The USA is a leader in the level of development of e-commerce. Here, to this day, special laws have repeatedly introduced a moratorium on the taxation of e-commerce. However, it does not mean at all that e-commerce entities are not subject to taxation, but rather pay taxes in the generally established manner, like other entities; it is indicated that only in this area additional taxes are not levied2.

China also occupies one of the leading positions in the e-commerce market. Like other countries, China has a problem with tax evasion by e-commerce entities. In order to regulate this area, a special law was adopted here in 2014, according to which all e-commerce entities must be registered and this must be indicated on the website. At the same time, cooperation with other countries in the field of e-commerce taxation is seen as a priority in China.

We studied the principles of improving the taxation of e-commerce based on international experience and considered the issues of its implementation in the Republic of Uzbekistan.

In order to avoid obstacles to the development of e-commerce in the early stages of its development and immediate growth, taxation issues in such approaches as maintaining the current tax system of the generally established order, the absence of additional taxes and other mandatory payments, and the non-application of individual taxes were considered by the administration with caution, to accelerate the development of this type of commerce in recent years, many countries have spoken about the need to improve the taxation system, taking into account its features in terms of preventing budget losses. Based on this, the factors listed above should be taken into account when developing a taxation model for entities operating in this area, as well as in the process of improving the tax control system.

Technically, the Internet is a process that makes it easier to access information about taxes and their collection. However, in taxation practice, commerce via the Internet also creates a number of problems. Which, in particular, cover international and national interests. International ones include: determination of tax jurisdiction, international double taxation, gaps in the tax system, unhealthy competition; to national: determining the procedure (system) for taxation of the taxpayer, improving tax administration, shortcomings in tax legislation, etc.

Today, the taxation of e-commerce has the following problems:
the seller does not know the status of the buyer, in particular, whether he is a resident or non-resident, a legal entity or an individual, etc.;

in e-commerce, it is often difficult to determine the place of sale of goods, which is necessary for the correct calculation and payment of taxes, and, in some cases, determining the sale of goods or the provision of services (for example, electronic software products) is also a problem. It should be noted that in the context of two types of taxation of these two objects, uncertainty is further enhanced;the emergence of problems with taxation due to the fact that it is difficult to confirm the cancellation of a completed auction via the Internet in the event of a buyer's refusal to accept the goods in an e-commerce environment;E-commerce entities typically use servers located in other countries for tax evasion purposes. However, their operation is considered a permanent establishment and may entail the payment of all taxes in the manner prescribed by e-commerce entities.This clearly raises two problems, in particular, such as collecting all taxes from ecommerce entities for the state and knowing the exact amount that can be paid for e-commerce entities.

The Internet is an activity aimed at regularly generating income and can be carried out not only by taxpayers registered in the prescribed manner and maintaining tax records, but also by entities that have not gone through this procedure. Such activities require special supervision by the competent authorities to identify and appropriate administrative and criminal punishment for illegal business activities.

When goods ordered via e-commerce are paid for in cash, for example when a courier delivers goods to the buyer, this may allow the business entity to avoid cashing in the cash and increases the risk of reducing, destroying or concealing the tax base. In our opinion, it is advisable that a mandatory condition for payment for purchases through e-commerce should be a transfer only using a non-cash form of payment.

At the same time, taking into account the development of e-commerce and trade in our country, in order to limit the unofficial income of entrepreneurs engaged in this activity, the introduction of remote online electronic cash registers based on electronic digital standards implemented in the country is required.It should be especially noted here that the introduction of remote electronic cash registers in our country will create, firstly, opportunities for the further development of e-commerce, and, secondly, will help solve a number of problems in the taxation of income of entrepreneurs in the field of e-commerce.The issue of taxation of digital goods remains relevant in the economy. Thus, legally, in the digital economy, customs duties must be charged when moving goods from one place to another. Meanwhile, in global tax practice, an effective mechanism for controlling the movement of these goods across the customs border has not yet been created. In particular, methods for collecting customs duties on goods in e-commerce have not yet been developed. As a rule, refusal to pay customs duties on electronic goods is explained by the fact that the costs of customs control exceed the amount of customs duties.

Currently, the global community has not yet developed a common and unified approach to the taxation of e-commerce. This problem is addressed in different countries using different approaches, resulting in certain difficulties for taxpayers and tax collectors. Thus, problems of taxation of foreign e-commerce entities arise when administering direct taxes related to the determination of a permanent establishment, and indirect taxes related to the calculation and payment of value added tax.

Electronic money also plays an important role in e-commerce, the increase in volume of which makes it difficult to handle mandatory payments, such as value added tax and income tax. It should be noted that electronic processes indirectly affect the formation and activation of various offshore financial institutions, as well as the withdrawal of tax revenues from the tax jurisdiction.

Unfortunately, in the process of rapidly developing modern information technologies, failure to eliminate emerging problems in the near future can lead to the fact that a significant part of the state's tax revenues will be lost. The virtualization of transactions and the increase in the number of goods transferred digitally further complicate the process of identifying the subject of taxation and monitoring taxation processes.

We believe that in conditions where modern communication technologies are poorly developed and e-commerce is just emerging, the taxes paid by entities in this area are insignificant. It is under such circumstances, i.e. when e-commerce does not have a significant impact on the formation of the state budget, it is necessary to provide some tax incentives in this area and focus on systemic regulation.

In this case, low taxes or their abolition altogether, in our opinion, can become the most important factor in the development of electronic commerce and the wider use of electronic forms of commercial agreements between entities. In this regard, it is necessary to reconsider the tax policy applied to e-commerce in our country, i.e. levy taxes on the basis of generally established principles.

CONCLUSION

Based on the results of a study of the specifics of e-commerce and its taxation, the following conclusions were made:

1. Today, e-commerce is important not only if it has positive aspects for a particular business entity or consumer, but also in the socio-economic development of the country. It should be recognized that e-commerce not only has a positive impact on the economy of any country, but at the same time it is a factor in the emergence of some problems. Thus, issues related to the regulatory regulation of some aspects of e-commerce have not yet found their final solution. In particular, in the conditions of modern realities, the accelerated development of commerce requires solving the issue of taxation of its subjects.

2. State tax policy in the field of e-commerce largely depends on the development of information technology in the country, in particular, if a number of leading countries (USA, Japan, Canada, South Korea, Australia) advocate maintaining the current preferential tax regime for e-commerce, while others (EU countries, China), on the contrary, are trying to eliminate gaps in the taxation of e-commerce and coordinate this activity with the state from the point of view of the budget and tax interests. Another area that has emerged in the taxation of e-commerce in the world is directly related to the policies implemented by a number of states.

3. Noting the advantages of e-commerce, changes in traditional economic relations have complicated tax and customs legislation, in particular, monitoring the implementation of agreements, when there are cases of non-fulfillment or abuse of their obligations by taxpayers who are subjects of the e-commerce market, using gaps in the legislation. This requires control not only from tax authorities, but also supervision from the competent authority to identify and appropriate administrative and criminal punishment for illegal business activities.

4. Tax authorities, within the framework of their powers, can control the movement of funds and electronic money transfers to bank accounts of commercial organizations that have bank accounts and electronic wallets, and receive information about this activity from credit organizations. However, if such activity is carried out not by an official entrepreneur, but by an individual with an electronic wallet, then there is no possibility of tax control over the electronic flow of such funds. In this process, it is also advisable to establish the obligations of credit institutions regarding the income of suppliers of electronic products and services of national and foreign commercial entities.

5. One of the reasons for the emergence of tax administration problems in the process of taxation of electronic commerce is the lack of a coordination system between the tax authorities of different countries. The need to develop areas of international cooperation between tax services in improving tax administration in the field of e-commerce is noted.

6. There are many ways to avoid taxation at the level of Internet transactions or an entire business, as a result of which the tax base for VAT, income tax and other mandatory payments for e-commerce entities is significantly reduced, and therefore it is necessary to develop and apply a separate approach that takes into account Features of taxation of e-commerce.

7. Carrying out taxation of e-commerce entities in the generally established manner helps to reduce the tax base of e-commerce in the country and does not ensure the execution of budget revenues. The features of this activity must be taken into account when developing a national taxation model, including improving the tax control system.As a proposal, we can point out that studying and researching the problems and features of e-commerce and its taxation, rapidly developing and having significant tax potential, e-commerce in the foreseeable future can become one of the factors in the formation of an effective taxation mechanism, on the basis of which losses of budget revenues can be prevented.

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