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E-Commerce Adaptation and Digital Spending Patterns During the COVID-19 Economic Slowdown

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Abstract
The economic downturn lie led to the rapid e-commerce adaptation with the increase in global revenues by 25-55% to $1.7 trillion by 2022 while the industry in India grew from $38 billion in 2019 to $79 billion in 2021 with the huge increase in UPI transactions from 24 billion to 74 billion driving the market. This systematic literature review (SLR) is a collection of 42 peer-reviewed sources based on PRISMA principles and it examines pre and post pandemic expenditure trends through the synthesis of themes from the TAM and UTAUT frameworks.
Among the most important results is the fact that there was a four times increase in global grocery sales (from 5% to 20% market share) with the essentials making up 60% of the Indian shopping carts and the orders coming from Tier-2 and Tier-3 cities constituting 50% of the total which, in turn, reduced the global GDP contraction by 3.4% and the Indian GDP contraction by 6.6%.Introduction. Omnichannel strategies were boosted by 16% in 2022; nevertheless, there are still digital divides, 70% of India's rural population is still offline and emissions have doubled.
The implications call for the installation of infrastructure and cybersecurity for an inclusive recovery and the need fo0r primary longitudinal studies is emphasised to overcome the limitations of secondary data.
Keywords: *E-commerce adaptation, COVID-19, digital spending patterns, UPI transactions, digital divide*

I. Introduction

The COVID-19 pandemic caused a worldwide economic crisis that was unique in its intensity and scope. This was a major reason for the shift in the digital channel with retail shopping, affecting the consumer and the way they behaved [1]. The pandemic acted as a catalyst that led businesses to adopt e-commerce as a lifesaving method and as a necessity for households. This paper discusses the core issue of the gradual change in digital spending patterns during the lockdowns, sets the research goals, and gives a picture of developments through 2024 when the post-pandemic normalization blended with the continued online growth.

Economic Context of COVID-19

The corona virus pandemic declared in March 2020, brought about an economic crisis which shrank the global economy by 3.4% in 2020, while India being the worst-hit country recorded a huge dip of 6.6% in its GDP due to stringent lockdowns that virtually emptied 70% of the retail market [2]. E-commerce was the victor, as it turned out to be the only market presence for many, and the global online market revenues even climbed up by 25-30% in 2020-2021 as the consumers shifted their buying habits to the very essentials like food and medicines. In the year 2022, the surge in digital sales trends caused by the pandemic was already dying down, since inflation and disruption in supply chains were in part responsible for the slowdown; however, the shopping pockets remained with non-essential items like clothing and electronics still commanding a 15%-20% resurgnce on platforms like Amazon and Flipkart aided by the growing digital/shopping trend [3].

Problem of Statement

Economic recessions typically stimulate the consumption of less, however, COVID-19 was a major factor that accelerated the digital transformation process at an unprecedented rate: The U.S. e-commerce sector saw its share of total sales grow from 11% before the pandemic to 21% by the year 2021, India was also quick to follow with a rise from 4% to 10% partially due to a 3-fold increase of UPI transactions to 74 billion by 2022. Several issues remained, including digital divides in rural areas, with only 30% of India's population having internet access by 2023, and a threefold increase in cybersecurity threats which incorporated phishing events. In 2024, global e-commerce steadied at $6.3 trillion (18% of retail), but the uneven recovery process brought to light the frailties of SME adaptations and customer trust.

Research Objectives

The present paper is aimed at the following: (1) global and Indian consumer spending trends pre and post 2020; (2) the strategies of adaptation like the omnichannel integration; (3) the impact on the economic recovery as per the 2024 data. It brings together previous research to demonstrate how digital trends cushioned the impact of the slowdowns and thus guided the policies for inclusive growth.

II. Literature Review

E-commerce The pandemic effect E-commerce took a bigger and more rapid leap during the pandemic than before. The growth was made possible by the increased internet availability and the usage of mobile phones, especially in the developing countries like India, which was the only one that experienced e-commerce retailing in the beginning but still had the potential for a $38 billion market in 2019 [4]. The smartphone users grew to 500 million, and digital payment systems like UPI, which started as early as 2016, contributed to the realization of this potential. The pre-COVID trend had already shown a preference for fashion and electronics, the latter two accounting for 35% and 20% of e-commerce sales, respectively, with the grocery segment lagging at less than 1% due to cultural habits favoring wet markets and the limited range of supply chain. The technology adoption process in e-commerce was described by theorists using models like Technology Acceptance Model (TAM), which accounts for acceptance based on ease and usefulness perceived by the users [5]. On the other hand, the lack of infrastructure for technology in rural areas and the digital divide issue were the main hindrances to widespread acceptance.

Increases in Electronic Commerce Around the World During the course of COVID-19

The lockdowns resulted in a massive shift in consumer behavior, which in turn led to a boom in e-commerce that the world had never seen before—by 2020 alone, the global sales experienced a rise of 25–55 percent [6]. The online sale of groceries has gone up from 5% to 20% in important areas like the US and Europe, and a notice from McKinsey has it that there has been a 25x faster adoption of online shopping compared to the trends that were blooming right before the COVID pandemic. This development trajectory was powered by several forces including government-led initiatives such as the US stimulus checks that raised people's discretionary spending online, and platforms that facilitated contactless delivery. For instance, the demand for home fitness equipment and pantry items experienced a whopping 100-300% growth in developed markets, which is indicative of a transition from spending on experiences to buying of essential products. Nevertheless, economic downturns made the inequalities worse; lower-income households were the ones that suffered the most as they were less able to access the internet and this in turn limited their participation in any online activities that lasted longer [7]. Research studies utilizing UTAUT indicate that social influence and performance expectations are two of the most important factors driving adoption of technology during uncertain times.

Shifts in Digital Spending That Are Particular to India

The pandemic, COVID-19, in India, brought a drastic change in the e-commerce industry with the market unambiguously leaping from a value of $38 billion in 2019 to $79 billion in 2021. The sizzle was powered by the 3.5 times upturn of online shoppers who finally number up to 120 million [8]. As the online payments gained further momentum due to the closures, UPI transactions rose from 1.2 billion in March 2020 to above 4 billion by the middle of 2021. Hence, it was these platforms that took the upsurge of grocery sales by 150-200% such as Flipkart and BigBasket. Moreover, Jio's cheap data led to the growth of rural areas, and the proportion of orders going to Tier-2/3 cities rose from 30% to 50%. The very funk induced by the economic recession, which saw a -6.6% of GDP in FY2021, caused consumers to alter their spending habits, leading to the food category taking 60% share of the carts by 2021 up from 30%. Fashion buying, on the other hand, dropped down to 15% [9]. The changes that were made by the MSMEs were supported by government initiatives like ONDC and FDI liberalization; still, difficulties remained: 40% of consumers complained of late deliveries and women-headed households had a 20% higher online dependency as one of the mobility constraints.

Theory-Based Frameworks That Guide Adaptation Frameworks

Analytical lenses for these transformations have led to the development of frameworks like TAM and UTAUT. The main idea behind these models is that the urgency caused by the pandemic made people perceive the usefulness more, and consequently, the adoption rates went up [10]. Detailed models which incorporate external influences such as health worries and economic hardships show that trust in platforms was one of the factors that helped to reduce risk aversion. The Diffusion of Innovations theory explains that the late-adopters in India were lured by the cash-on-delivery hybrids' superior convenience. Several researchers have found out that the global trends (for instance the fifty percent increase in China) have outpaced India's because the latter already had the necessary infrastructure; however, India's micro-local adjustments (like ten-minute delivery)

have outdone their global counterparts. The data obtained after the peak indicate a simultaneous repositioning of strategies with hybrid ones coming out as resilient ones.

Different theoretical frameworks and comparative insights

Incorporating these concepts, empirical syntheses still highlight the importance of e-commerce in the economic resilience sector. For instance, worldwide digital spending increased by 16% from last year to this year, no matter the declines in the retail sector, while India's UPI network processed business transactions worth $1.5 trillion in the year 2022 [11]. The contrast between pre-and post-COVID data reveals that the market had been accelerated: global penetration reached 20% at the end of 2021 (14% before COVID) and India's online retail market share had risen from 2% to 5%. The analysis pointed out that both sustainability and equity were endangered, as last-mile delivery carbon emissions had doubled. In addition, 30% of the poorest people in India are still not connected. Looking ahead, researchers urge government officials to integrate the training and technological infrastructure for the digital ones to not only avoid but also maintain the already made progress in the digital divide.

III. Methodology

This study adopts a secondary research method through a systematic literature review (SLR) to gather and analyze the existing evidence regarding the trends in e-commerce adaptation and digital expenditure during the COVID-19 pandemic that caused the economic crisis. Systematic Literature Review provides rigorous, reproducible scrutiny of scholarly literature, complying with established norms for non-empirical research publications. The method focuses on the thematic style of integration with worldwide and India-related data while avoiding primary data collection which allowing extensive insights from the post-pandemic period to be utilized [12].

Protocol for Systematic Literature Review

The review was conducted according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, albeit with a secondary synthesis adjustment. The preliminary searches were aimed at such databases as Google Scholar, PubMed Central (PMC), UNCTAD, OECD, World Bank repositories, and Scopus, using the keywords: "e-commerce COVID-19," "digital spending patterns economic slowdown," "online consumer behaviour pandemic," and "India e-commerce lockdown." The use of Boolean operators (AND/OR) made the search queries much better, for example, "COVID-19 AND (e-commerce OR digital payments) AND (spending OR adaptation)". The time frame was set between 2020 and 2025 that covered the entire period of post-pandemic people's and goods' movement which was still high [13].

The criteria of inclusion required only English-language peer-reviewed publications, reports, and some grey literature (e.g., UNCTAD statistics) to be included that contained empirical data on spending changes (e.g., global e-commerce growth of 25-55%) or adaptations (e.g., UPI increases in India). To mention non-empirical viewpoints, literature published before 2020 and through a lens of non-economic research were part of the exclusion criteria. Out of the 1,200 references that were initially identified, the first 85 sources that were filtered by title and abstract resulted in 42 full-text inclusions after an MMAT (Mixed Methods Appraisal Tool) quality assessment for credibility and relevance was carried out.

Data Sources and Inclusion Criteria

The sources that were utilized ranged from quantitative reports (for instance, the UNCTAD e-commerce index which points out a revenue increase of 19-26%) and qualitative consumer behavior research (for instance, the TAM/UTAUT models which are on the adoption) to analysis focused on India (for instance, online grocery surges during lockdowns). There was a regional focus on the competitiveness deficiencies of SMEs which was identified in the previous user programs [14]. The data extraction was done using NVivo for theme coding which included the following: (1) pre/post-pandemic baselines, (2) expenditure measures (for example, $1.7 trillion being the worldwide digital boom), and (3) adaptation tactics [16].

Analytical Methodology

Thematic synthesis required continuous coding into categories of global trends, Indian patterns, and economic consequences. Narrative synthesis combined conspicuously the quantitative patterns (e.g., comparative spending data) and qualitative insights thus ensuring triangulation. In bias prevention, sources were cross-referenced (e.g., World Bank versus academic publications). Limitations here reliance on secondary data may overlook micro-level variations; primary surveys are recommended to be conducted.

IV. Result and Analysis

The enlarged research has been conducted with the aim of measuring the extent to which e-commerce has boomed and the parallel shifts in digital spending during the economic downturn brought about by COVID-19. The analysis is based on the information accrued from 42 studies that formed part of the systematic literature review. The stimulus-driven demand for essentials led to a global revenue increase of 25-55% during the period 2020-2021, amounting to $1.7 trillion. This, in fact, brought forward the pre-pandemic estimates by 19%. The number of UPI transactions in India tripled to 74 billion by 2022, thereby contributing to India's market growth from $38 billion in 2019 to $79 billion in 2021, which in turn mitigated the impact of a 6.6% GDP contraction relative to the previous year. Thematic coding has uncovered three primary patterns: spending shifts, adaptation strategies, and geographical disparities. These patterns are presented in tables as a means of facilitating clear communication during peer review.

Global Spending Pattern Trends

When the lockdowns were first implemented, it completely changed how consumers used to shop. Consequently, the proportion of online retail sales went up from 14% to 20% of total sales for the year 2021. Moreover, online groceries in the USA and Europe increased their market share by fivefold, from 5% to 20%. The demand for electronic and home gym equipment saw a dramatic increase of 100-300%, while the fashion industry faced a setback of 15% because of the closure of offices. In addition, the growth of liquor and home improvement was 16% and 14%, respectively. E-commerce in the US still managed to account for 16.1% of total retail sales in the second quarter of 2020, a leap from 11.8% in the first quarter, which means the pandemic played a part in its growth. The existing connectivity issues have made it even harder for the poor to access the market, and department stores are reported to have lost sixty percent of their customers.

Category	Pre-COVID Share	Peak COVID (2020-21)	2024 Level	Growth Factor	Source
Groceries	5%	20%	12%	4x	McKinsey/US Census
Electronics	20%	35%	28%	1.75x	UNCTAD
Fashion	35%	15%	22%	Stabilized	World Bank
Home Improvement	10%	24%	18%	2.4x	OECD

E-commerce Adaptation Strategies

Companies not only enhanced their click-and-collect capabilities but also invested heavily in their logistics; thus, Amazon and Flipkart saw their logistics up by 50%, while Shopify and Walmart their respective gross merchandise volumes by 95% and 72% of the last year, and Amazon and Flipkart's logistics got double their size. UTAUT models indicate the Indian market for e-commerce have grown 3.5 times (from 35 million to 120 million) due to social influence and UPI (from 1.2 billion to 4 billion transactions). Small and medium-sized enterprises (SMEs) adopted the Open Network for Digital Commerce (ONDC) to boost their reach, but 40% experienced delays; meanwhile, the UK and Brazil witnessed a rise in cross-border B2B transactions. Hybrid cash-on-delivery systems were among the new innovations that, according to the theory of Diffusion of Innovations, would soon be adopted by latecomers.

India-Specific Quantitative Insights

Nonetheless, when considering a negative GDP of 6.6% for the fiscal year 2021 and also in the Tier-2/3 orders went up by 20% & got to 50% with the support of Jio's rural data; grocery purchases moved up to 60% essentials from 30%. Women-led households relied more on internet resources by 20% as a result of access issues; the $1.5 trillion UPI volume in 2022 was a factor in the recovery. Access in rural areas got better but still, 70% of the population was without connectivity which hindered equality.

Metric	2019 Baseline	2021 Peak	2024 Sustained	Growth	Source
UPI Txns (Bn)	1.2	4+	74	62x	NPCI/UNCTAD
Shoppers (Mn)	~35	120	150	4.3x	Flipkart
Rural Orders %	30%	50%	45%	1.67x	BigBasket
Grocery Share	30%	60%	45%	2x	ONDC Reports

Comparative and Sustainability Insights

India's retail participation escalated from 4% to 10% and Zealed 21% of the US's growth, thus reducing the global decline by 3.4%. Nevertheless, sustainability got worse—the carbon footprint from last-mile delivery multiplied and the gross merchandise value of the top 13 B2C companies reached $2.9 trillion, which is a 20.5% increase. E-commerce resisted the crisis and expected $4.28 billion by 2023, which is a 14% rise. The triangulation confirms TAM/UTAUT: during the crisis the perceived utility went up thus enabling SME survival but also exposing the need for policy intervention in some areas.

V. Discussions

India's retail share rose from 4% to 10%, outgrowing the US's 21% increment and softening a 3.4% worldwide dip. Nonetheless, offering was reduced in terms of environmental impact with last-mile emissions doubling; the top 13 B2C firms made $2.9 trillion in gross merchandise value, or a 20.5% rise. E-commerce became even stronger during the crisis, predicting $4.28 billion as a result of the 3.4% global GDP decline and 6.6% Indian GDP drop. Digital resilience has been accelerated by the synthesis of the results that confirms the key role of e-commerce in lessening the economic slowdown due to COVID-19. According to TAM/UTAUT adoption predictions, which were driven by the crisis, marketplaces like Amazon and Flipkart not only plugged retail gaps but also drove sales by creating revenue influxes of 25-55% in their respective regions.Besides that, the threefold increase in UPI transactions allowed for a 50% penetration of Tier-2/3 cities. The post-2022 growth rate of 16% was sustained through omnichannel strategies, which mitigated inflation aligned with a focus on necessity (the grocery segment alone witnessed a 400% increase—$8 billion—by 2023, representing a 14% growth). Triangulation supports TAM/UTAUT here which perceived utility soared during the crisis, enabling the SME survival while highlighting areas for policy intervention.

Indications for the Recuperation of the Economy

Digital transitions, especially through the ONDC, helped in creating an inclusive recovery process for small and medium enterprises (SMEs), however, the recovery was not the same everywhere. The 70% of the rural population in India that was still offline and the 20% higher dependence of women-led households exposed the gaps between various segments of the population, which in turn the divisions along with the last-mile logistics caused by the increasing emissions of CO2 during the recovery period exacerbated. The tripling of phishing attacks has already taken its toll on online businesses and consequently, policymakers should, as matter of priority, initiate measures to enhance the resilience of infrastructure (e.g. Jio-like data subsidies) and cybersecurity measures to secure the global e-commerce market that is projected to reach $6.3 trillion by 2024, which will be 18% of the retail market share. Introductory Remarks Hybrid models appear to be the most optimal solution when it comes to the competitiveness of small and medium-sized enterprises (SMEs) in India.

Existing studies have certain limitations

The main drawback of secondary synthesis is that it relies on the aggregated data, that can hide minor differences like the effects of ONDC at the firm-level or the trends of consumers in 2025. There could be a tendency to favor positive trends in the publication of grey literature (UNCTAD/World Bank), which gives a very limited picture by not mentioning—like in the case of delivery complaints—a whopping forty percent of failures. To support the claim of causality from UTAUT correlations, longitudinal primary surveys are a must.
The deductions from these facts are not only hints but a clear pathway to inclusive digital policy, proving that e-commerce will still be the winner in terms of recession in the future and at the same time promoting the setting up of connections for the groups that have been less represented.

VI. Conclusions

The pandemic economic crisis has drastically accelerated the use of e-commerce worldwide, with global revenues growing by 25-55% and reaching $1.7 trillion, while the Indian market shot up from $38 billion in 2019 to $79 billion in 2021, thanks to a huge rise in UPI transactions from 24 billion to 74 billion and 4 times increase in grocery sales. A comprehensive review of 42 studies reveals that digital platforms act as important buffers against a global GDP decline of 3.4% and a reduction of 6.6% in Indian GDP, with a continual rise of 16% now expected after 2022 through omnichannel strategies and the consumer's basic needs shifted by the application of TAM/UTAUT models.

SMEs have been able to stay strong through the use of the Open Network for Digital Commerce (ONDC) and the move into Tier-2 and Tier-3 cities which together account for half the total orders. But the problem is still there: 70% of the rural population does not have access to digital tools, the amount of carbon dioxide produced through the industry has increased twofold, and cyber-attacks have increased threefold. Thus, the governments should put the emphasis on making Internet access easier, protecting the network from intrusions, and establishing pro-poor policies that will lead to recovery for all.Primary data on the 2025 micro-impacts are essential for future research in overcoming secondary constraints, thereby strengthening e-commerce importance in resilient economies.

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