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A study on the impact of digital transformation on businesses globally during the post pandemic period

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Abstract
The COVID-19 pandemic revealed the inadequacies of traditional corporate systems, accelerating the shift to digital economies and resulting in extensive upheaval. The epidemic necessitated a rapid transition to digital platforms for e-commerce, digital payment systems, and remote work. Industrialized countries such as the US and UK quickly adopted e-commerce, banking, and digital collaboration capabilities to sustain operations and engage with consumers.
The COVID-19 epidemic has accelerated the digital transformation of business, altering consumer behaviour, organizational frameworks, and international trade. Likewise, emerging countries such as Brazil and India have surmounted challenges, including infrastructure deficiencies, by adopting digitalization in critical sectors such as agriculture, education, and banking.
This paper examines the transformations in digital commerce since the pandemic, the challenges and opportunities it presents for businesses and governments, and the strategic responses necessary to capitalize on the advantages while mitigating the disadvantages.
The study provides a global perspective on the influence of digital economies on post-pandemic recovery, emphasizing the vital role of digital technologies in transforming economic landscapes globally.

Keywords: COVID-19, e-commerce, digital payment, consumer behaviour, international trade

1. Introduction
The COVID-19 pandemic disrupted international manufacturing networks and imposed cross-border trade restrictions, resulting in a drop in global demand for products and services (IMF *et al*., 2023; UN DESA, 2021) [11]. In the first year of COVID-19, global trade in goods and services diminished by around 7.6 percent, much less than the contraction seen during the global economic recession (UN DESA, 2021). This information is derived from the World Monetary Situation & Prospects 2021 study. The analysis indicates that digital commerce and the Fourth Industrial Revolution were already transforming the structure of international trade prior to the onset of the pandemic.
The COVID-19 pandemic precipitated a significant transformation in world commerce.
The swift shift to digital platforms was propelled by lockdowns, social isolation, and supply chain interruptions. Although digitization in commerce was already underway before to the pandemic, its onset significantly expedited the use of digital technology within a few of months.
This study examines the landscape of digital commerce post-pandemic, evaluating corporate adaptations, challenges faced, and emerging trends that will influence the industry's future. Research examines the potential impact of this transformation on developing countries, global trade, and small to medium-sized enterprises (SMEs).

2. The Conceptual Framework of Online Shopping
In economic literature and growth settings, the term "digital trade" is a relatively recent and developing idea that is a facet of the new digital economy. Despite the extensive infiltration of digitalization into many societal facets, OECD *et al*. (2020) have observed that it is mostly unrecognized and excluded from official statistics. This is attributable to the following factors: (i) the lack of estimation methodologies to quantify the growth of digital commerce in national accounts; (ii) the current classification system for firms; and (iii) the absence of a

unified definition for commonly used terms such as online economy, digital trade, digital transition, sharing economy, and gig economy, all of which are interrelated concepts within the digitalized economy. This observation aligns with UNCTAD (2019), which noted that the lack of universally accepted definitions for various facets of the digital economy, along with several related economic terms, stems from the novelty of these issues and the current early stages of global digitalization.

The Handbook on Assessing Digital Trade, created in 2020 by the OECD, WTO, and IMF, amalgamated several concepts of digital trade. Multiple categories, such as "potentially digitally enabled," "digitally enabled services," "ICT-enabled services," and "e-commerce," were used to measure different facets of digital trade before the release of this guidebook (OECD *et al*. 2020). Digital commerce is now characterized as all worldwide transactions that are ordered and provided digitally, as indicated in the 2023 second edition of the compendium (IMF, OECD, UN, and WTO, 2023) [11].

Digital trade currently refers to digitally offered services delivered virtually via ICT networks, while digitally ordered services conform to the OECD's established definition of e-commerce (International Monetary Fund, OECD, UN, and World Trade Organization, 2023; OECD *et al*., 2020). E-commerce is fundamentally the use of the Internet and other networks, including intranets, for the buying and selling of items and services, as articulated by several writers (OECD *et al*., 2020; Turban *et al*., 2017) [9]. These transactions include the online sale and purchase of goods and services, as well as transactions executed via platform-based companies (UNCTAD, 2019).

3. Objectives of the Study

- To assess the impact of the digital transition on international trade.
- To identify the challenges faced by businesses during the digital transformation.
- To examine the prospects for sustainable and inclusive digital commerce.
- To provide policy suggestions for the effective execution of digital transformation.

4. Methodology

This qualitative study is grounded on journal papers, research reports, and secondary data from esteemed institutions, including the World Bank, OECD, and UNCTAD. To provide practical ideas, we examined case studies of successful online shopping adaptations from various countries.

5. The Effect of the COVID-19 Pandemic on Commerce

Despite disruptions created by COVID-19, the Indian e-commerce sector continues to expand at a pace of 5%, with estimated sales of US$56.6 billion in 2021, as reported by NASSCOM. The Indian e-commerce market is anticipated to escalate from $38.5 billion in 2017 to $200 billion by 2026, driven by increasing smartphone penetration, the implementation of 4G networks, and growing consumer affluence. Flipkart, Amazon India, Paytm, Indiamart, and Myntra dominate India's e-commerce sector, anticipated to have a 30% increase in sales.

A 23% rise over last year's GMV of US$ 7.4 billion is anticipated for the 2021 Christmas season on Indian e-commerce platforms, with projections exceeding US$ 9 billion. In 2020, India's e-commerce sales surpassed $50 billion, ranking eighth internationally, positioned between France and Canada.

Despite the challenges and disruptions posed by COVID-19, the e-commerce sector in India continues to expand, as reported by NASSCOM.

In 2020, India ranked third in the world with 140 million online buyers, behind China and the United States. Revolutionary 5G technology will significantly enhance the internet surfing experience, and Indian consumers are already adopting this new technology. A report by IAMAI & Kantar Research forecasts that the number of internet users, which was around 620 million in 2020, will climb to 900 million by 2025, representing a 45% growth from 2020.

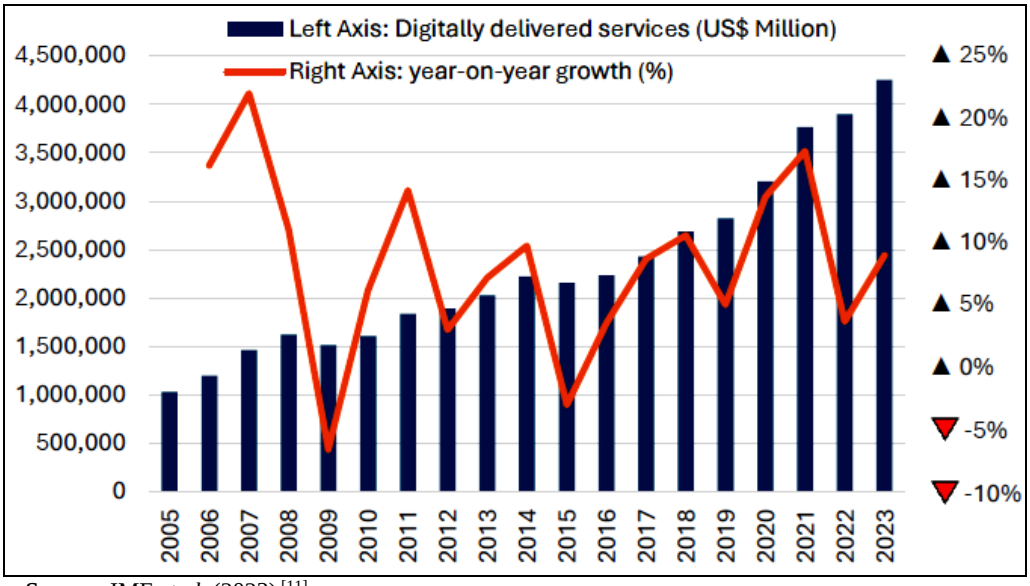
In October 2021, online shopping in India generated $4.6 billion over the Christmas season. Between October 15 and November 15, 2020, online sales in India amounted to Rs. 58,000 crore (US$8.3 billion), reflecting a 65% increase from Rs. 35,000 crore (US$5 billion) in the preceding year.

Payoneer determined that the Indian e-commerce sector ranked ninth in terms of worldwide expansion. Although the food and consumables, jewelry, and furniture sectors are seeing remarkable growth, the consumer electronics and apparel industries now lead in online sales.

6. The Present Condition of Digital Trading

Current data indicates that internet commerce is producing substantial revenue, however a comprehensive evaluation remains unattainable. According to OECD *et al*. (2020), fifty percent of global services exports, amounting to $2.9 trillion, were supplied digitally. In 2020, digital trade constituted 25% of worldwide business, amounting to about USD 5 trillion, as reported by the OECD (2024). In 2023, global exports of digitally offered services amounted to $4.25 billion, reflecting a 9.0% rise from the prior year, and constituted 13.8% of total world exports (WTO, 2024).

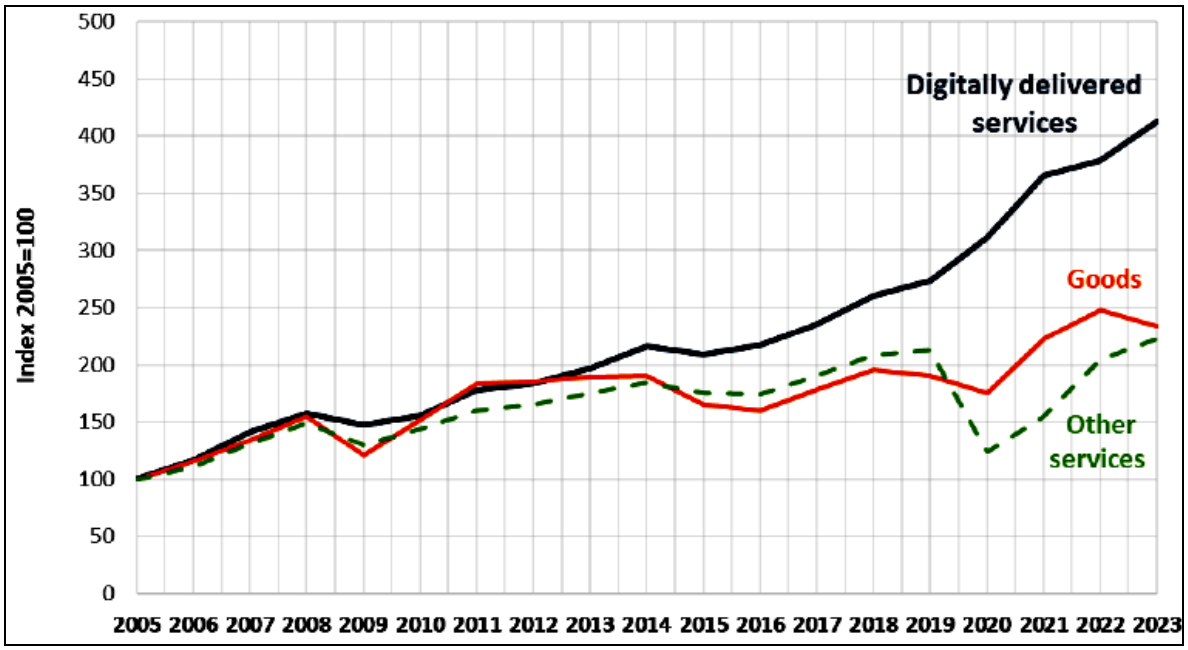
The International Monetary Fund and others (2023) indicate that the most rapidly expanding segment of international trade is cross-border digitally delivered services. Between 2005 and 2018, total service exports rose by 6%, but exports of digitally delivered services grew at an annual pace of 7% (OECD *et al*., 2020).



Source: IMF *et al*. (2023) [11]

Fig 1: The growth of internet commerce from 2005 - 2023

The World Trade Organization estimates that the value of digitally supplied services has almost increased fourfold since 2005. These services will expand at an annual pace of 8.1% from 2005 to 2022, exceeding goods exports by 5.6% and other services by 4.2%. At present, digitally provided services constitute 54% of total service exports (IMF *et al*., 2023) [11]. Despite a decline in product exports in 2023, digital trade flourished.



Source: WTO (2024)

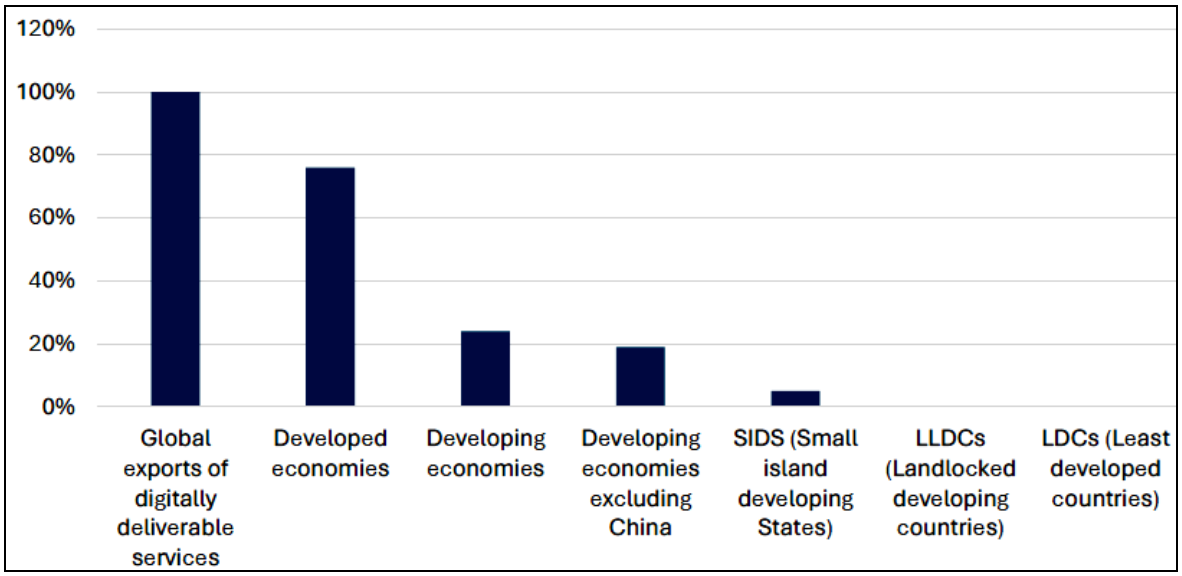
Fig 2: The ascendance of e-commerce relative to conventional retail

7. Digital trade and the digital divide

Despite the growth of digital commerce and the internet economy, the revenue earned from these developments has mostly been focused in two countries: the United States and China. The OECD (2019) notes that the monetary geography of the internet economy does not display a traditional North-South divide, but rather a differentiation between a mature economy and a growing economy at the forefront. The World Bank's income classifications, determined by annual GNI per capita (Acheampong & Udvari, 2020) [10], designate high-income countries such as the US as "developed," whereas China, categorized within the upper middle-income band, is considered "developing."

In 2021, China and the United States accounted for 75 percent of all patents related to blockchain technology, 50 percent of global investment in the Internet of Things, and over 75 percent of the global market for public cloud computing. Ninety percent of the market value of the world's 70 largest digital platforms was represented by them, whilst Europe's contribution was 4 percent, and Africa and Latin America together accounted for less than 1 percent. Chinese and US corporations, including Microsoft, Amazon, Apple, Facebook, Google, Tencent, and Alibaba identified as the seven "super platforms" accounted for around 70 percent of the total market value (UNCTAD 2021).

According to UNCTAD (2023), frontier technologies that enable Industry 4.0, notably AI and the Internet of Things (IoT), are predominantly developed by a select group of countries, namely the United States, China, and certain Western European nations. The U.S. leads in major computing platforms, while China excels in 5G, drone technology, solar photovoltaic systems, and robotics.



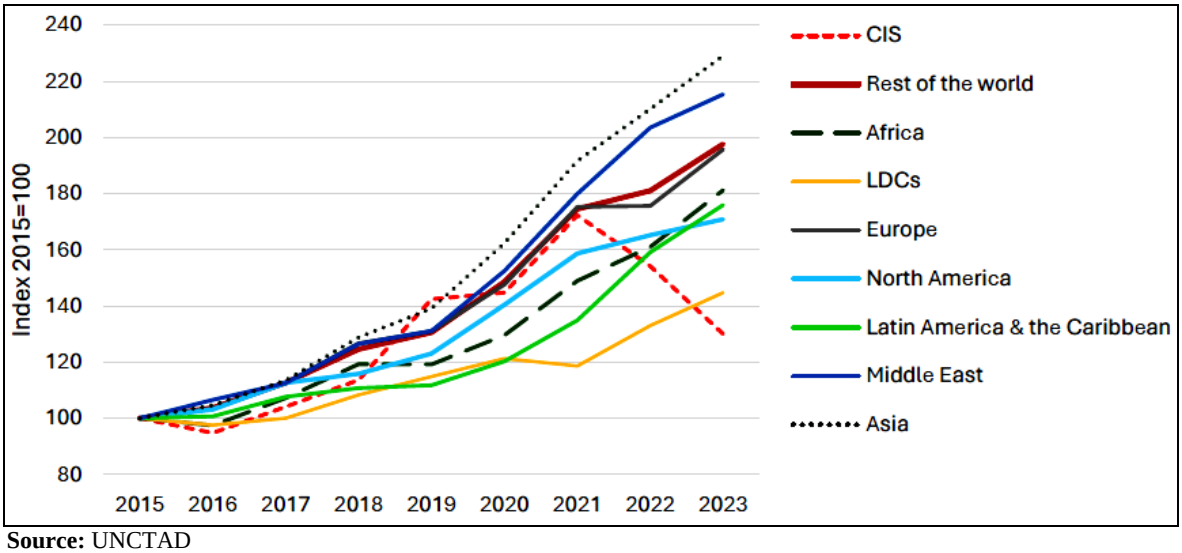
Source: UNCTAD

Fig 3: Percentage of global exports of digitally provided services by region in 2022 (%)

From 2000 to 2021, China dominated Industry 4.0 and green frontier technologies, holding about fifty percent of all patents. China produced a total of 536,115 patents, including 100,958 for the Internet of Things, 71,055 for artificial intelligence, and 62,063 for big data. During the same period, the United States generated 169,447 patents, including 49,318 for robotics, 43,193 for artificial intelligence, and 19,523 for electric vehicles (UNCTAD 2023).

China has recently overtaken the United States to emerge as the preeminent force in e-commerce, anticipated to reach a global valuation of almost twenty-six trillion by 2018, constituting roughly 30 percent of the worldwide gross product (UNCTAD, 2021). According to Chevalier (2024), global internet retail sales surpassed 5.8 trillion U.S. dollars by 2023 and are expected to rise by 39 percent, perhaps exceeding 8 trillion dollars by 2027. In 2023, the Chinese e-commerce market was the biggest worldwide, with online sales comprising over fifty percent of the country's retail transactions.

The concentration of wealth from digital commerce in a restricted number of countries and regions indicates a digital divide, with a few nations leading in digital advances, while developing and least developed areas lag significantly. As reported by UNCTAD (2022), in 2021, developed economies represented 73% of global services exports, including essential digital services like communication technologies and information technology, which saw significant growth, while developing regions, including Africa and the Americas, demonstrated lower growth in services exports. In 2022, developed countries accounted for more than 80% of global exports of digitally provided services.



Source: UNCTAD

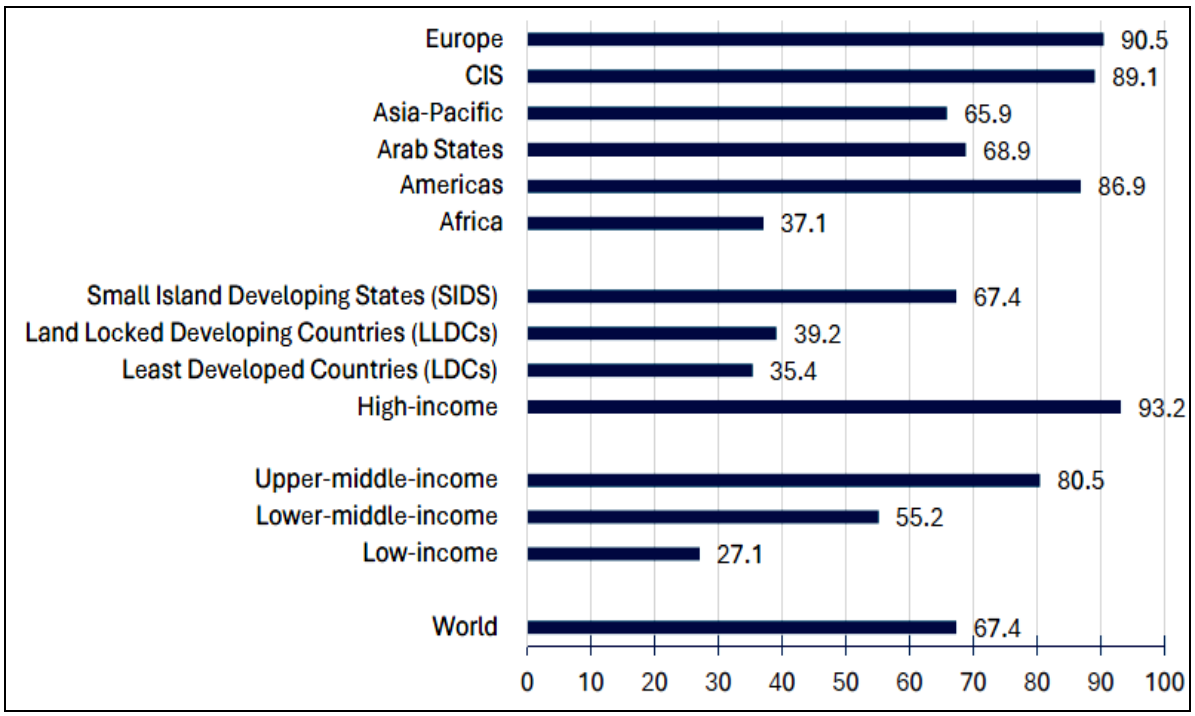
Fig 4: Regional Expansion of Digitally Delivered Services, 2015-2023

The relationship among COVID-19, digital commerce, and the digital divide

Data and empirical research demonstrate that the COVID-19 pandemic accelerated digital transformations, particularly the increased adoption of e-commerce and digitally delivered services (UNCTAD, 2021), as many activities previously performed in-person shifted to online platforms (ITU, 2021; WEF, 2020). Throughout the pandemic, several kinds of international trade declined, although digitally deliverable services had significant growth in 2021 and continued to climb marginally by 3 percent in 2022 (UNCTAD, 2023).

Notwithstanding significant growth in digital trading over the COVID period, engagement has been irregular. The IMF *et al*. (2023) [11] assert that industrialized nations mostly export digitally provided services; nevertheless, notable advancements have also transpired in several developing countries, especially in Africa, where Ghana, Morocco, and South Africa lead the way. Nevertheless, the growth of digital commerce in least developed countries (LDCs) remains gradual, with Africa representing only 1% of global digitally delivered services exported in 2022. The COVID pandemic intensified the imbalance in digital exports between the most and least developed countries, as shown by IMF *et al*. (2023) [11].

Comparable to their shortfall in digital commerce, available evidence indicates that LDCs also fall below the world average in internet use metrics. According to ITU data, 92% of inhabitants in LDCs has mobile service, although less than 50% have access to the necessary 4G networks for digital commerce (ITU, 2024). Furthermore, only 36% of residents in LDCs use the internet, partly owing to high connection costs. Figure 5 depicts disparities in internet use across countries classified by socioeconomic status, revealing that higher-income nations have a larger population of online users.



Source: ITU (2024)

Fig 5: Region-specific Internet Consumer Percentage as of 2023

8. Prospects for Companies

The Development of E-Commerce and Digital Markets

The most evident outcome of the digital revolution is the rise in internet purchasing.

Alibaba, Amazon, and Shopify were among the corporations that posted record results. While small and medium-sized businesses (SMEs) began using Instagram Shopping and WhatsApp Business to stay alive, Flipkart and JioMart both expanded their consumer bases in India.

An Examination of an Actual Case: The 20% increase in M-Pesa use in Kenya after 2020 is a perfect illustration of how fintech may help digital commerce in developing nations.

Revolutions in Supply Chains

Digital technologies like blockchain, artificial intelligence, and the internet of things are being utilized more and more to improve the transparency, efficiency, and resilience of supply chains. Businesses are investing more in digital monitoring and forecasting systems as a result of a move away from just-in-time inventory management and toward "just-in-case" strategies.

The Confluence between Electronic Payments and Fintech

Digital payment mechanisms are increasingly required for online purchases. Innovations like contactless payments, mobile wallets, and BNPL (Buy Now, Pay Later) services have changed how consumers pay. According to PwC, the global fintech market would be valued at $305 billion by 2025.

Access and Inclusion

Even while e-commerce has created new markets, there is a risk that digital inequality may only worsen.

For rural and vulnerable communities, access to affordable devices, reliable internet, and digital literacy may be

especially difficult. There is still a gender and age gap in internet access in many parts of the world.

9. Challenges in the current environment for Businesses
Dangers in the Cyber World
Cyberattacks like ransomware and data breaches have becoming more common on e-commerce sites. SMEs may not always be able to afford strong cyber defenses.

Dependency on Digital Networks
These days, a lot of firms depend substantially on online resources. Power outages, server failures, or software problems might cause significant disruptions to operations.

Structures of Law and Policy
Many countries still need updated or developed rules pertaining to internet trade. Inconsistent tax laws, data localization specifications, and the lack of laws protecting digital consumers provide compliance issues for businesses.

10. Conclusion
The rise of digital commerce accelerated the transition to a global digital economy, a process further expedited by the COVID-19 pandemic.
Simultaneously, the pre-existing digital disparities were exacerbated by the pandemic. The preponderance of wealth generated by the digital economy has accrued to the United States and China.
For sustainable growth post-COVID, it is essential to prioritize inclusive engagement in digital commerce. The post-epidemic digital global economy presents significant opportunities and substantial challenges for businesses. To remain competitive and grow, enterprises must adopt digital transformation.
For long-term sustainability, this shift must be secure, transparent, and guided by robust policy frameworks. To establish a digital commerce ecosystem that benefits all stakeholders, collaboration among governments, corporations, and international organizations is essential.

11. Suggestions
- Governments and international organizations should emphasize broadband development and affordable digital access as investments in digital infrastructure.
- Assist small and medium-sized firms (SMEs) with their digital transformation by offering resources such as subsidies, tax incentives, and training programs.
- Promote public-private partnerships to establish secure digital commerce environments, therefore enhancing cybersecurity measures.
- Establish International Regulatory Frameworks: International cooperation is important to unify digital commerce procedures.
- Educational systems need to include early digital skill instruction to enhance digital literacy.

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