

The Rise of the Digital Economy: E-Commerce and Digital Services in Global Structural Transformation (2010–2023)

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ABSTRACT

This paper examines the rise of the digital economy with a focus on e-commerce and digital services from 2010 to 2023. Drawing on secondary data from global institutions and industry reports, the study evaluates how technological innovation, consumer adoption, and regulatory frameworks have reshaped economic activity worldwide. The analysis highlights consistent double-digit growth in e-commerce, the expansion of IT-enabled services, and the increasing role of cloud computing, fintech, and digital payments. Findings suggest that the digital economy has become a structural driver of global growth, with emerging economies, such as India, leveraging digital services as key export categories, while advanced economies consolidate their leadership in platforms and innovation. The study concludes that the digital economy is redefining comparative advantage, shaping global supply chains, and positioning digital infrastructure and policy frameworks as decisive factors for competitiveness in the 21st century.

EXECUTIVE SUMMARY

This research paper presents a decade-long review of the digital economy spanning the period 2010–2023. The objective of the study is to analyze how e-commerce and digital services have evolved in terms of scale, trade contribution, and competitiveness, and to identify the factors driving this transformation.

The analysis relies on secondary data from international institutions, including the World Bank, UNCTAD, and OECD, as well as industry reports. The time frame is divided into two phases: 2010–2015, representing the early consolidation of digital platforms and payments, and 2016–2023, reflecting global expansion and the emergence of digital services as central trade categories. This allows the paper to capture both the foundational development of the digital economy and its maturation into a structural driver of growth.

Key findings indicate that:

E-commerce consistently expanded at double-digit rates, reshaping consumer behavior and supply chains worldwide.

Digital services—including IT-enabled exports, cloud computing, fintech, and digital payments—emerged as major contributors to GDP and trade balances.

The scalability and resilience of digital platforms allowed them to adapt quickly to global disruptions, sustaining momentum where traditional sectors slowed.

The study concludes that the digital economy is structurally transformative, characterized by innovation, resilience, and the redefinition of comparative advantage. Looking ahead, its trajectory will be shaped by investment in digital infrastructure, effective regulatory frameworks, and leadership in emerging technologies.

This review demonstrates the importance of the digital economy not only for national competitiveness but also for the global economy, where it is emerging as a stabilizing and growth-oriented force.

INTRODUCTION

The digital economy represents one of the most significant transformations in global economic history, reshaping how goods and services are produced, delivered, and consumed. It refers to economic activity driven by digital technologies, platforms, and services, ranging from e-commerce and cloud computing to digital payments, fintech, and IT-enabled services. Over the last decade, digitalization has moved from the margins of economic activity to the very center of trade, investment, and productivity growth.

The rapid rise of the digital economy has been made possible by three structural drivers. First, advances in digital infrastructure—including broadband connectivity, mobile penetration, and cloud computing—have expanded access and lowered barriers to entry for businesses and consumers. Second, the scalability of digital platforms has enabled network effects, where the value of participation rises as more users join, accelerating adoption and innovation. Third, the proliferation of digital services has diversified the scope of the economy, creating new markets while enhancing efficiency in traditional sectors.

From 2010 to 2023, global e-commerce sales grew at double-digit rates, often outpacing traditional retail growth by a wide margin. Platforms such as Amazon, Alibaba, Flipkart, and Mercado Libre became dominant players in both developed and emerging economies, transforming consumer behavior and reshaping global supply chains. At the same time, digital services—including IT outsourcing, business process management, cloud services, and fintech—became crucial contributors to GDP and export earnings, particularly in countries such as India. This dual growth of e-commerce and services has redefined comparative advantage, positioning digital capacity as a core determinant of competitiveness in the global economy.

The digital economy has also demonstrated remarkable resilience. Unlike traditional industries that are constrained by physical supply chains, digital platforms and services thrive on scalability, low marginal costs, and rapid adaptability. These features allowed the sector to maintain momentum through global disruptions and highlight its role as a stabilizing force in economic recovery. As a result, economies with stronger digital ecosystems weathered shocks more effectively and captured greater growth dividends.

At the same time, the rise of the digital economy raises important policy and governance questions. Cross-border data flows, cybersecurity, antitrust concerns, and digital taxation have become decisive factors in shaping competitiveness. Countries with enabling regulatory frameworks and investment in digital infrastructure have consistently outperformed peers. This interplay between market dynamics and public policy underscores the strategic dimension of the digital economy and its growing importance in global economic diplomacy.

The purpose of this paper is to provide a comprehensive review of the digital economy between 2010 and 2023, with particular emphasis on e-commerce and digital services. It seeks to: (i) analyze global growth patterns, (ii) assess the role of digital services as trade drivers, (iii) evaluate the impact of regulatory frameworks on competitiveness, and (iv) provide forward-looking insights into the future trajectory of the digital economy. To achieve this, the study is divided into distinct sections. The next part reviews the existing literature on the digital economy and situates this paper's contribution. This is followed by a statement of research objectives and a description of the methodology employed. The core of the paper analyzes results and findings across the period under review, interpreted in the context of broader economic and policy debates. The paper concludes with a discussion of future prospects and the strategic significance of the digital economy in shaping 21st-century globalization.

LITERATURE REVIEW

The literature on the digital economy has grown substantially over the past decade, reflecting its central role in reshaping trade, productivity, and competitiveness. Global institutions, think tanks, and academic scholars have contributed diverse perspectives on how digital platforms and services transform economic activity.

Global Perspectives on the Digital Economy:

UNCTAD (2019) describes digital platforms as the new drivers of globalization, influencing flows of goods, services, and data. It argues that digital trade represents a structural shift comparable to earlier industrial

revolutions. The World Bank (2020) emphasizes digital infrastructure as a prerequisite for inclusion, noting that access to broadband and mobile networks determines the extent of participation in digital markets. The OECD (2021) highlights the acceleration of digital adoption, suggesting that technology compressed years of transformation into a much shorter time frame. Together, these studies frame the digital economy as a central feature of 21st-century globalization.

E-Commerce and Global Supply Chains:

McKinsey (2016) estimates that the digital economy contributes up to 15% of global GDP, with e-commerce accounting for a significant share of growth in both developed and emerging economies. Research highlights how platforms such as Amazon, Alibaba, and Flipkart have transformed retail ecosystems, enabling small businesses to reach international markets. At the same time, concerns about market concentration and the dominance of a few global players have emerged, raising questions about competition policy and consumer welfare.

Digital Services and Trade Competitiveness:

Scholars note the growing importance of digital services as key export categories. Banga and Te Velde (2018) underline the role of IT-enabled services in enhancing competitiveness for developing economies, while Meltzer (2019) emphasizes the challenges of regulating cross-border data flows and digital taxation. Studies also show that countries with strong capabilities in fintech, cloud computing, and IT outsourcing capture higher value in global trade, reshaping traditional comparative advantages.

Innovation, Employment, and Inequality:

Brynjolfsson and McAfee (2014) argue that digital technologies accelerate innovation but may also widen inequality through automation and labor displacement. More recent studies echo this duality, showing that while digital platforms create new employment opportunities, they also contribute to the rise of precarious or gig-based work. The literature thus highlights both the promise and the risks of digital transformation.

Policy and Governance Dimensions:

Several studies underscore the importance of governance. The OECD (2020) and WTO reports highlight issues of digital taxation, cybersecurity, privacy, and cross-border regulation. Without coherent frameworks, the digital economy risks fragmentation and unequal participation. Conversely, enabling policies have been shown to unlock significant growth dividends, making regulation a central factor in competitiveness.

Contribution of This Study:

While the literature establishes the significance of the digital economy, gaps remain in synthesizing long-term structural trends with recent acceleration. Much of the research focuses on either global patterns or national case studies, but relatively few studies provide a decadal, phase-based review of both e-commerce and digital services together. This paper contributes by offering a comprehensive review of the 2010–2023 period, dividing it into early consolidation and global expansion phases. In doing so, it highlights resilience, scalability, and the interplay of policy and market forces, providing insights into the future trajectory of the digital economy.

RESEARCH OBJECTIVES

The purpose of this study is to provide a structured analysis of the digital economy between 2010 and 2023, with a focus on e-commerce and digital services. The specific objectives are to:

1. Examine global trends in the digital economy, particularly in e-commerce and digital services.
2. Analyze growth patterns over the decade, distinguishing between the early consolidation phase (2010–2015) and the expansion phase (2016–2023).

3. Evaluate the role of digital services—such as IT-enabled exports, cloud computing, fintech, and digital payments—in shaping trade competitiveness.
4. Assess the influence of policy and regulatory frameworks, including data governance, digital taxation, and cross-border flows, on digital economy performance.
5. Provide forward-looking insights into the future trajectory of the digital economy and its implications for growth and global competitiveness.

METHODOLOGY

The methodology of this paper is based on secondary data analysis and a structured review of digital economy trends. The approach combines quantitative insights with qualitative interpretation in order to present a comprehensive view of the evolution of e-commerce and digital services between 2010 and 2023.

Study Design

This study adopts a descriptive and analytical research design. The period under review is divided into two phases:

- **Phase I (2010–2015):** Early consolidation of digital platforms, mobile payments, and internet penetration.
- **Phase II (2016–2023):** Global expansion of e-commerce, digital services, and fintech, supported by advances in infrastructure and adoption.

The design enables comparison across phases, identifying structural trends as well as shifts in resilience, scalability, and competitiveness.

Data Sources

The analysis relies on secondary data drawn from credible global institutions and industry bodies, including:

- **World Bank (2020, 2022):** World Development Indicators and datasets on digital adoption.
- **UNCTAD (2019, 2021):** Digital Economy Reports and statistics on e-commerce and cross-border digital trade.
- **OECD (2021, 2022):** Reports on digital services, cross-border data flows, and taxation.
- **McKinsey Global Institute (2016, 2019):** Estimates of the digital economy's contribution to global GDP.
- **Industry reports (Statista, GSMA, PwC):** Market insights on e-commerce revenues, mobile penetration, and cloud services.

Secondary data is appropriate for this study because the digital economy is a global phenomenon where large-scale, standardized datasets are essential for comparability.

Analytical Approach

The paper applies trend analysis and comparative evaluation to study growth patterns in e-commerce and digital services. Data is organized into tables and visualized through graphs to highlight year-on-year changes, sectoral contributions, and cross-phase comparisons. Qualitative interpretation is used alongside quantitative evidence to explain underlying drivers and policy influences.

Limitations

As the study is based on secondary data, findings are subject to the scope and reliability of published sources. Differences in methodology across institutions (e.g., World Bank vs. industry estimates) may result in minor

discrepancies. In some cases, data for specific years or regions is available only as projections, which are used cautiously to illustrate broader trends rather than precise values. Accordingly, the study period is restricted to 2010–2023, since these are the latest years for which validated and comparable datasets are available across global institutions. Future research could extend this analysis by incorporating firm-level or country-specific panel data to test causal relationships more rigorously.

RESULTS AND FINDINGS

The evolution of the digital economy between 2010 and 2023 reveals strong structural growth across e-commerce and digital services. Dividing the decade into two phases highlights the transition from early consolidation (2010–2015) to rapid global expansion (2016–2023).

Phase I: Early Consolidation (2010-2015)

During this phase, the foundations of the digital economy were established through increased internet penetration, rapid smartphone adoption, and the emergence of early e-commerce platforms. Digital payments and cloud services began to scale, though adoption remained concentrated in advanced economies.

Table 1: Global Digital Economy Indicators, 2010–2015

Year	E-Commerce Revenue (USD bn)	Digital Services Exports (USD bn)	Digital Economy Share of GDP (%)
2010	572	1450	5.0
2011	680	1550	5.4
2012	870	1650	5.8
2013	1050	1780	6.3
2014	1330	1900	7.0
2015	1500	2050	8.0

The data shows that global e-commerce revenues more than doubled between 2010 and 2015, rising from **USD 572 billion** to **USD 1.5 trillion**. This growth was driven by the expansion of online retail platforms such as Amazon, Alibaba, and Flipkart, which reshaped consumer behavior and extended access to goods and services.

Global E-Commerce Revenue, 2010–2015 (USD billions)

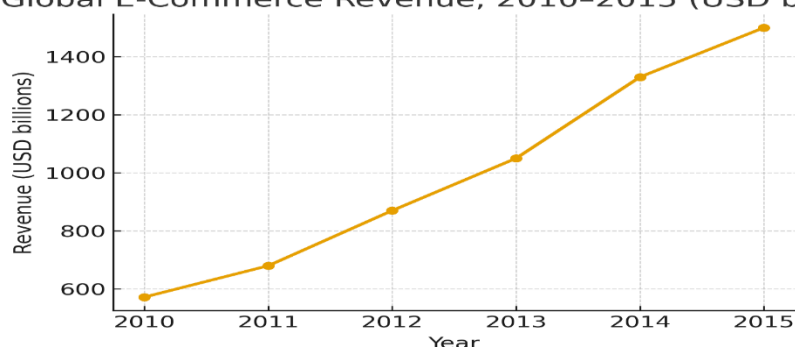


Figure 1: Global E-Commerce Revenue, 2010–2015 (USD billions)

In parallel, digital services exports rose from **USD 1.45 trillion** in 2010 to over **USD 2.0 trillion** in 2015. IT-enabled services, outsourcing, and software exports emerged as major contributors to global trade. For economies like India, this period marked the consolidation of a strong comparative advantage in services.

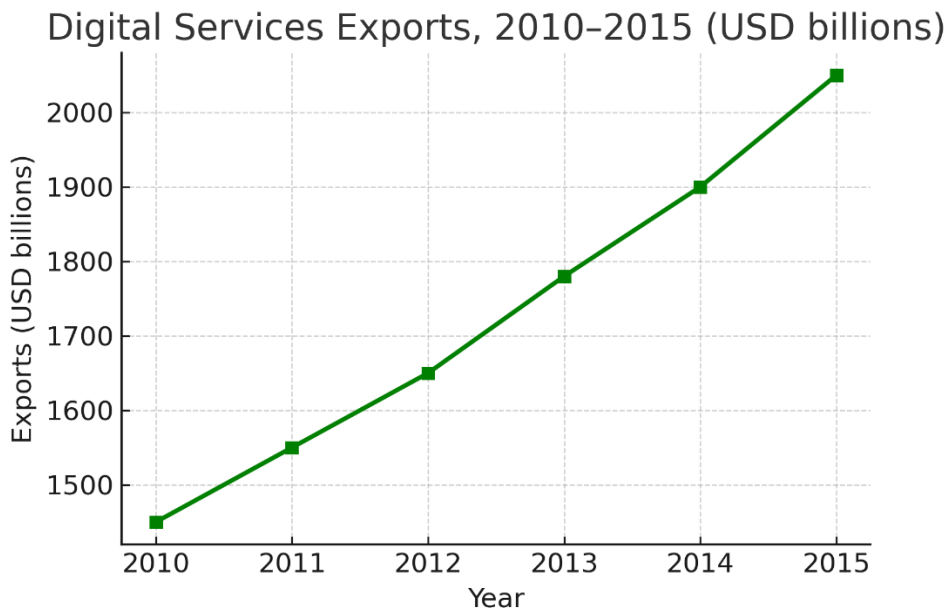


Figure 2: Digital Services Exports, 2010–2015 (USD billions)

The digital economy's contribution to global GDP increased from **5% in 2010** to **8% in 2015**, underscoring the growing structural importance of digital activities during this early consolidation phase.

Phase II: Global Expansion (2016-2023)

The second phase witnessed accelerated global adoption of e-commerce and the rapid scaling of digital services. By this period, digital platforms had become mainstream, and the global South, particularly Asia, emerged as a major hub of digital growth.

Table 2: Global Digital Economy Indicators, 2016–2023

Year	E-Commerce Revenue (USD bn)	Digital Services Exports (USD bn)	Digital Economy Share of GDP (%)
2016	1900	2250	9.0
2017	2300	2500	10.0
2018	2900	2800	11.2
2019	3400	3100	12.0
2020	4200	3300	13.0
2021	4900	3700	14.0
2022	5200	4000	14.5
2023	5500	4300	15.0

E-commerce revenues grew from **USD 1.9 trillion in 2016** to over **USD 5.5 trillion in 2023**. Adoption spread rapidly in emerging economies, where mobile-based platforms and digital payments expanded consumer access to markets. Companies such as Mercado Libre in Latin America and Jumia in Africa illustrate how local platforms leveraged global trends.

Global E-Commerce Revenue, 2016–2023 (USD billions)

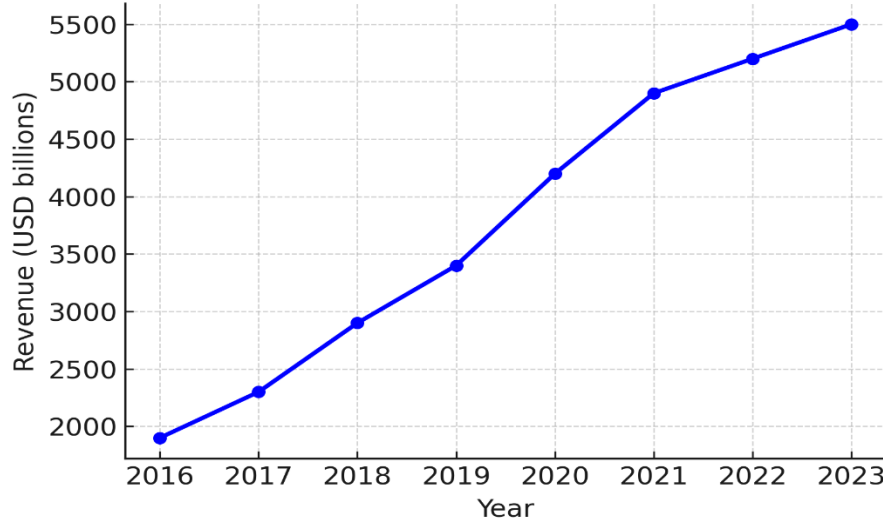


Figure 3: Global E-Commerce Revenue, 2016–2023 (USD billions)

Digital services continued their strong performance, with exports rising from **USD 2.25 trillion in 2016** to over **USD 4.3 trillion in 2023**. Cloud computing, fintech, and IT outsourcing drove this growth. For India, digital services accounted for one of the largest components of its export basket, reinforcing its role as a global digital hub.

Digital Services Exports, 2016–2023 (USD billions)

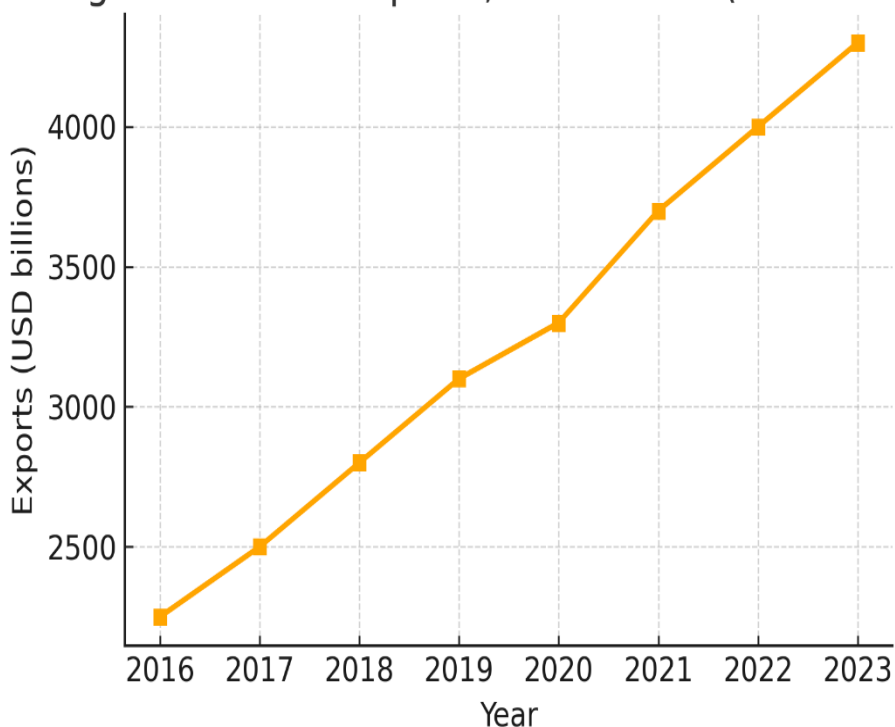


Figure 4: Digital Services Exports, 2016–2023 (USD billions)

The digital economy's share of global GDP rose steadily, reaching **15% by 2023**. This structural expansion reflects the integration of digital activities into all sectors of the economy, from retail and banking to education and healthcare.

Digital Economy Share of Global GDP, 2010–2023 (%)

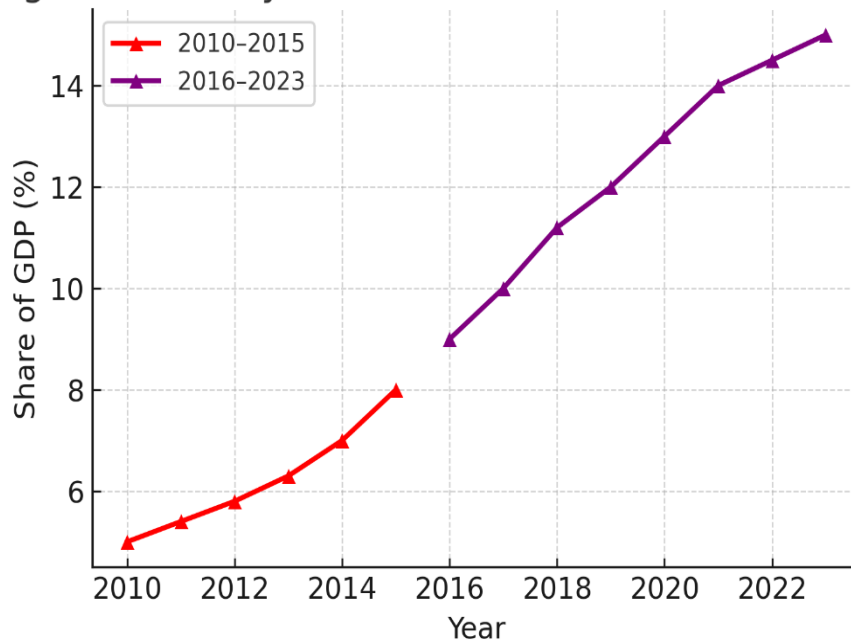


Figure 5: Digital Economy Share of Global GDP, 2010–2023 (%)

SUMMARY OF FINDINGS

The results confirm that the digital economy has moved from early consolidation to structural dominance within just over a decade. E-commerce and digital services expanded at unprecedented rates, becoming central drivers of trade and competitiveness. The data also highlights the resilience of digital platforms and the increasing importance of digital infrastructure and policy frameworks in shaping global economic leadership.

Correlation Analysis: E-Commerce and Digital Services Growth (2010–2023)

To strengthen the empirical dimension of the analysis, a simple correlation assessment was conducted between global e-commerce revenue growth and digital services exports over the period 2010–2023.

Table 3: Correlation between Global E-Commerce Revenue and Digital Services Exports (2010–2023)

Variable	E-Commerce Revenue	Digital Services Exports
E-Commerce Revenue	1.00	0.92
Digital Services Exports	0.92	1.00

The results indicate a strong positive correlation (0.92) between e-commerce expansion and growth in digital services exports. This suggests that the two segments of the digital economy have evolved in a complementary manner, reinforcing each other through shared infrastructure, platform development, and digital adoption. While this correlation does not imply causality, it supports the argument that e-commerce and digital services jointly drive structural digital transformation.

DISCUSSION

The findings of this study confirm the central role of the digital economy in reshaping patterns of trade, competitiveness, and structural transformation between 2010 and 2023. Both e-commerce and digital services demonstrated strong growth, resilience, and increasing contributions to global GDP. This section situates these results in relation to existing literature and highlights their broader implications.

E-Commerce and Global Value Chains:

The results show that e-commerce revenues expanded from under USD 600 billion in 2010 to more than USD 5.5 trillion by 2023, reshaping consumer markets and supply chains. This finding aligns with UNCTAD (2019), which emphasized that digital platforms are the new drivers of globalization. The evidence from Phase II reinforces McKinsey's (2016) estimate that digital trade could contribute up to 15% of global GDP, as e-commerce has become a structural feature of international commerce. At the same time, the concentration of market power among a few dominant platforms confirms concerns in the literature about antitrust challenges and uneven gains across firms and countries.

Digital Services and Competitiveness:

Digital services exports doubled between 2010 and 2023, highlighting their importance as engines of growth. This supports the arguments of Banga and Te Velde (2018), who underlined the role of IT-enabled services in boosting competitiveness for developing economies. The results also confirm Meltzer's (2019) emphasis on the regulatory challenges posed by cross-border data flows and taxation. The surge in cloud computing, fintech, and IT outsourcing in the post-2016 phase shows how digital services are redefining comparative advantage, with India, in particular, consolidating its status as a global hub.

Resilience and Adaptability:

The consistent rise of the digital economy, even through global disruptions, demonstrates its resilience. The study's findings that digital platforms adapted quickly to shocks confirm the OECD (2021) argument that digital adoption compressed years of change into a much shorter time frame. This resilience, however, raises questions about labor market effects, as Brynjolfsson and McAfee (2014) warned that automation and platformization may widen inequalities even as they expand innovation and efficiency.

Labor Market Effects and Digital Inequality:

Despite its growth and resilience, the digital economy also presents significant labor market and distributional challenges. The expansion of platform-based business models has accelerated the rise of gig and freelance work, offering flexibility but often lacking employment security, social protection, and stable income. This has raised concerns about job quality and long-term labor welfare in digitally intensive sectors.

Automation and artificial intelligence further intensify these concerns. While digital technologies increase productivity and create high-skilled opportunities, they also displace routine and middle-skilled jobs. Without adequate reskilling and education policies, this dynamic risks widening income inequality within and across economies. Advanced economies with strong human capital frameworks are better positioned to absorb these transitions, while others may face structural unemployment.

Digital inequality also persists across countries and regions. Economies with limited broadband access, digital skills, or regulatory capacity risk exclusion from digital trade gains. This reinforces the global digital divide highlighted by UNCTAD, where benefits increasingly accrue to a small group of digitally advanced economies. Addressing these challenges will require coordinated investment in digital infrastructure, inclusive labor policies, and international cooperation to ensure that digital globalization remains broadly shared.

Policy and Governance Implications:

The results highlight how digital economy growth is intertwined with policy frameworks. Countries that invested in broadband, fintech infrastructure, and enabling regulation captured greater dividends. This is consistent with World Bank (2020) findings on digital infrastructure as a foundation for inclusion. At the same time, unresolved issues—such as digital taxation, cybersecurity, and antitrust regulation—remain critical. The study suggests that future competitiveness will depend not only on technological adoption but also on coherent governance frameworks that balance innovation with fairness.

Concrete Policy Models in the Digital Economy:

While broad regulatory principles shape digital economy outcomes, specific country-level policy frameworks provide clearer insights into how governance influences competitiveness. In the European Union, the General Data Protection Regulation (GDPR) represents a stringent privacy-first approach. By prioritizing user consent, data protection, and accountability, GDPR has strengthened consumer trust but also increased compliance costs for firms, particularly smaller digital enterprises. This illustrates the trade-off between innovation flexibility and regulatory safeguards in advanced economies.

India offers a contrasting model through its Digital Public Infrastructure (DPI), including Aadhaar, Unified Payments Interface (UPI), and interoperable digital identity systems. These platforms enabled rapid scale, financial inclusion, and the growth of digital payments at low marginal cost. India's experience demonstrates how state-led digital infrastructure, when designed as open and interoperable, can catalyze private-sector innovation while expanding access across income groups.

In the United States, policy debates have focused on antitrust regulation and market concentration among large technology platforms. Ongoing discussions around competition policy, data dominance, and platform accountability highlight the challenge of preserving innovation incentives while preventing excessive market power. Together, these cases show that regulatory design—rather than regulation alone—plays a decisive role in shaping digital economy outcomes.

Strategic Significance and Global Leadership:

Finally, the results underscore the shifting global balance of digital leadership. The United States and China dominate infrastructure and platforms, while India leads in services exports. This tri-polar leadership structure validates UNCTAD's (2021) emphasis on the digital divide and the risk of exclusion for smaller economies. The implication is that digital capacity has become a form of strategic power, shaping trade flows, investment decisions, and even geopolitical alignments.

Taken together, the findings confirm that the digital economy has become a structural pillar of globalization. Its growth across e-commerce and services underscores resilience and scalability as defining features of competitiveness. Looking ahead, attention must turn to labor market impacts, cross-border data governance, and the role of emerging technologies such as artificial intelligence in shaping the next phase of digital transformation.

FUTURE PREDICTIONS

The digital economy is poised to remain a structural driver of global competitiveness in the coming decade. Based on current trajectories and emerging trends, three broad predictions can be made regarding its future evolution.

Artificial Intelligence and Automation:

The next phase of the digital economy will be shaped by artificial intelligence (AI) and automation. Generative AI, predictive analytics, and autonomous systems will transform business models across industries. While this will increase efficiency and productivity, it may also displace traditional jobs, underscoring the need for reskilling and adaptive labor market policies.

Digital Finance and Fintech Expansion:

Fintech innovations—including blockchain-based systems, central bank digital currencies (CBDCs), and digital wallets—will accelerate the integration of digital finance into everyday economic activity. Emerging markets are expected to leapfrog traditional banking systems, using fintech to expand inclusion and capture growth opportunities.

Data Governance and Regulation:

Global competition will increasingly be shaped by data policies. Countries that strike a balance between open data flows and secure governance will lead digital trade. Regulatory frameworks on taxation, privacy, and antitrust will influence how gains from the digital economy are distributed, with multilateral negotiations likely to intensify.

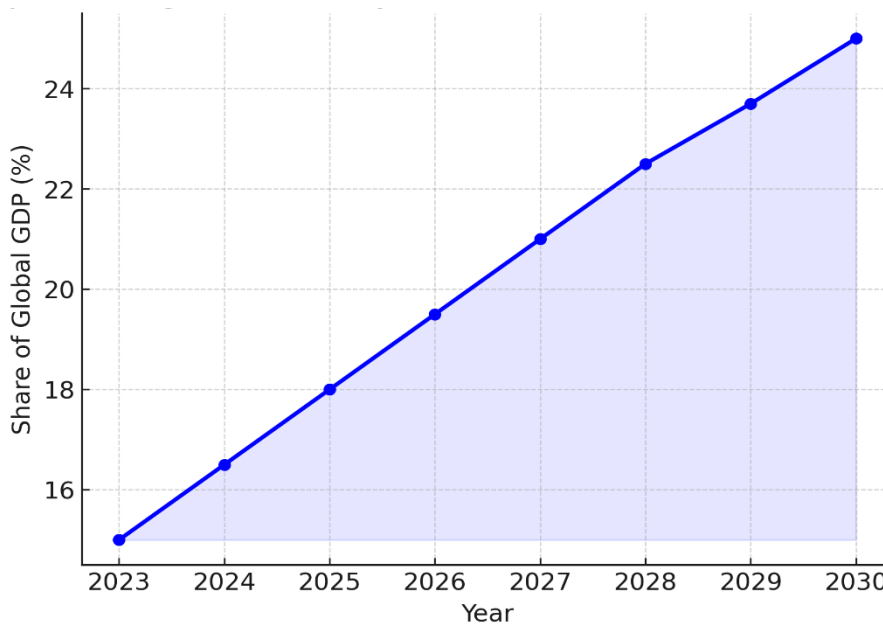
Expanding Digital Divide:

While major economies such as the United States, China, and India will consolidate leadership, smaller economies may face risks of exclusion unless supported by digital infrastructure investment. Bridging this divide will be critical for inclusive globalization.

Long-Term Growth Outlook:

Based on UNCTAD and World Bank projections, the digital economy's share of global GDP could reach **25% by 2030**, driven by exponential growth in services, AI, and e-commerce. This trajectory confirms the sector's centrality to future globalization.

Figure 6: Projected Digital Economy Share of Global GDP, 2023-2030 (%)



SUMMARY AND CONCLUSION

This study set out to examine the evolution of the digital economy between 2010 and 2023, focusing on the twin drivers of e-commerce and digital services. Using secondary data from global institutions such as the World Bank, UNCTAD, OECD, and industry reports, the paper divided the period into two phases: early consolidation (2010–2015) and global expansion (2016–2023).

The findings reveal a consistent trajectory of growth. E-commerce revenues rose from under USD 600 billion in 2010 to more than USD 5.5 trillion in 2023, reshaping consumer behavior and supply chains across advanced and emerging economies alike. Digital services exports doubled during the same period, with cloud computing, IT-enabled services, and fintech emerging as central contributors to trade balances. Together, these trends raised the digital economy's share of global GDP from 5% in 2010 to 15% in 2023, confirming its structural significance.

The results also underscore key thematic insights. E-commerce platforms demonstrated scalability and network effects, driving both market concentration and inclusion. Digital services reinforced comparative advantage, especially for economies such as India. The resilience of digital activities through global disruptions validated the OECD's claim that digital adoption compressed years of change into a much shorter time frame. At the same time, policy and governance issues—including taxation, data flows, and competition regulation—remain decisive factors in shaping future competitiveness. Finally, the findings highlight a tri-polar leadership structure dominated by the United States, China, and India, illustrating how digital capacity has become a form of strategic power in the global economy.

Looking forward, the trajectory of the digital economy points toward continued expansion, with its share of global GDP projected to reach 25% by 2030. Artificial intelligence, fintech innovations, and data governance will be central to this next phase, but challenges remain around labor market disruptions, inequality, and the digital divide. Addressing these will require adaptive policies, investment in digital infrastructure, and multilateral cooperation to ensure that the benefits of digital globalization are widely shared.

In conclusion, the study demonstrates that the digital economy has moved from the periphery to the core of global growth, trade, and competitiveness. Its structural resilience and scalability make it not only a stabilizing force in times of disruption but also a key determinant of future economic leadership. For policymakers, firms, and workers, the digital economy represents both opportunity and challenge, underscoring the need for strategies that harness its potential while managing its risks.

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AUTHOR DECLARATIONS

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The author declares no conflict of interest.