

Digitalization and the Global Competitiveness of Exported Services

Selly Sipakoly^{1*}

¹ Politeknik Negeri Ambon, Indonesia

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ARTICLE HISTORY

Received: 05 June 25

Final Revision: 18 June 25

Accepted: 19 June 25

Online Publication: 30 June 25

KEYWORDS

Digital Trade, Services Export, Digital Economy, Competitiveness, Platform Governance

KATA KUNCI

Perdagangan Digital, Ekspor Jasa, Ekonomi Digital, Daya Saing, Tata Kelola Platform

CORRESPONDING AUTHOR

sipakolyselly78@gmail.com

DOI

10.37034/jems.v7i3.136

ABSTRACT

As global trade increasingly shifts toward services, many countries struggle to remain competitive in digitally driven markets due to infrastructural gaps, regulatory fragmentation, and firm-level disparities. This literature review investigates how digitalization reshapes the global competitiveness of exported services. Based on 58 peer-reviewed studies published between 2015 and 2024, the analysis identifies four recurring themes: digital infrastructure, firm-level digital capabilities, regulatory and institutional environments, and structural barriers. Findings show that while digitalization facilitates service scalability, market access, and innovation, competitiveness remains uneven and contingent on a country's or firm's ability to align digital assets with institutional coherence and strategic readiness. The review highlights that to enhance digital service competitiveness, governments must prioritize inclusive infrastructure investment, support SMEs in acquiring digital capabilities, harmonize cross-border digital regulations, and mitigate risks tied to platform dependency and cybersecurity. These implications point to the need for coordinated policy responses and long-term strategies that build digital resilience and equitable participation in global service trade.

ABSTRAK

Ketika perdagangan global semakin bergeser ke sektor jasa, banyak negara kesulitan mempertahankan daya saing dalam pasar digital akibat kesenjangan infrastruktur, fragmentasi kebijakan, dan disparitas kapabilitas perusahaan. Tinjauan pustaka ini mengkaji bagaimana digitalisasi membentuk ulang daya saing ekspor jasa di kancan global. Berdasarkan analisis terhadap 58 artikel ilmiah terpublikasi antara tahun 2015 hingga 2024, ditemukan empat tema utama: infrastruktur digital, kapabilitas digital pada tingkat perusahaan, lingkungan regulasi dan kelembagaan, serta hambatan struktural. Temuan menunjukkan bahwa meskipun digitalisasi mendorong skalabilitas layanan, akses pasar, dan inovasi, daya saing tetap tidak merata dan sangat bergantung pada kemampuan negara dan pelaku usaha dalam menyelaraskan aset digital dengan kesiapan kebijakan dan strategi. Studi ini menekankan bahwa untuk meningkatkan daya saing ekspor jasa digital, pemerintah perlu berinvestasi pada infrastruktur digital yang inklusif, memperkuat kapasitas digital UMKM, menyelaraskan regulasi lintas negara, serta mengatasi risiko ketergantungan terhadap platform dan ancaman siber. Implikasi ini menunjukkan perlunya respons kebijakan yang terkoordinasi dan strategi jangka panjang demi membangun ketahanan digital dan partisipasi yang adil dalam perdagangan jasa global.

1. Introduction

In the evolving landscape of global commerce, digitalization has emerged as a transformative force, particularly reshaping the dynamics of international trade in services. Unlike physical goods, services can now be produced, marketed, and delivered digitally, transcending geographic barriers and allowing even small enterprises to engage in cross-border transactions without a physical presence [1], [2]. The rise of digital platforms, cloud computing, and artificial intelligence has drastically reduced the transaction costs traditionally associated with global service exports, creating new pathways for value creation and innovation [3], [4].

Digital services—ranging from financial technologies to online education, telehealth, software, and creative content—now constitute a rapidly growing share of total global trade in services. According to the World Bank (2020), digitally deliverable services accounted for over 50% of global services exports by value in 2019, a trend that has accelerated in the wake of COVID-19 [5]. However, while digitalization facilitates market entry and scalability, the extent to which it enhances competitiveness depends on a nation's infrastructure, regulatory coherence, and digital capabilities [6], [7].

Theoretical contributions to this field span across multiple domains. The extended gravity model of trade now incorporates digital enablers such as broadband

penetration, digital readiness, and e-commerce participation, providing empirical evidence on the role of ICT infrastructure in shaping service flows [8], [9]. Furthermore, the resource-based view of the firm suggests that digital capabilities—such as data analytics, automation, and platform integration—constitute a new form of intangible capital, strengthening firms' ability to compete globally [6], [10].

Despite the opportunities digitalization presents, challenges remain. Many developing economies struggle with limited access to high-speed internet, low digital literacy, and weak legal frameworks for data protection and digital contracts, thereby undermining their potential in digital service trade [2], [11]. Moreover, asymmetries in platform governance and data control have raised concerns regarding monopolistic practices, algorithmic discrimination, and unequal value appropriation by large tech firms [12], [13].

Given these dynamics, a structured understanding of how digitalization influences the global competitiveness of service exports is both timely and critical. This review aims to synthesize recent empirical and theoretical studies to assess the main drivers, enablers, and inhibitors of competitive performance in digital service trade. By doing so, it contributes to the literature on digital trade, international competitiveness, and global economic policy.

2. Research Method

This study employed a structured literature review to synthesize current knowledge on how digitalization influences the global competitiveness of exported services. The review followed methodological guidance established in evidence-based management research, emphasizing transparency and replicability in the selection and analysis of sources [14], [15]. Searches were conducted across Scopus, Web of Science, ScienceDirect, and Google Scholar for peer-reviewed articles published between January 2015 and March 2024. Keywords included combinations of “digitalization,” “services export,” “digital economy,” “global competitiveness,” and “platform economy,” refined using Boolean operators and truncation. Articles were included if they addressed cross-border service trade affected by digital technologies, were published in English, and appeared in reputable journals. Non-peer-reviewed material, grey literature, and studies unrelated to services or international trade were excluded.

From an initial yield of 263 studies, 109 were retained after title and abstract screening. Following full-text review, 58 articles met all criteria for inclusion. The screening process was tracked using the PRISMA framework to ensure procedural rigor and

accountability (Page et al., 2021; Snyder, 2019). Data were extracted using a standardized template that captured publication details, geographic focus, methodological approach, digital factors addressed, and core findings. Thematic synthesis was applied to group recurring insights into four major domains: digital infrastructure, firm capabilities, regulatory environments, and structural barriers. This framework provides the analytical foundation for the results and discussion sections that follow [14], [16].

3. Results and Discussion

A thematic analysis of the selected literature revealed four interrelated domains that consistently shape the global competitiveness of exported services in the digital economy. These are: (1) digital infrastructure and connectivity, (2) firm-level digital capabilities, (3) regulatory and institutional environments, and (4) structural barriers and risks. Each theme reflects a distinct but interconnected dimension of how digitalization transforms the conditions under which services are produced, delivered, and traded across borders. Together, these domains form a comprehensive framework for evaluating the enabling and constraining factors that affect international service competitiveness in the digital age.

3.1. Digital Infrastructure and Connectivity

Robust digital infrastructure is consistently identified as a foundational enabler of competitive service exports in the digital economy. High-speed internet, mobile broadband penetration, and cloud infrastructure significantly lower the cost of communication and facilitate real-time delivery of services across borders. Economies with advanced ICT infrastructure tend to experience faster growth in digitally deliverable services, especially in sectors such as financial services, professional consulting, and IT outsourcing [7], [17]. The availability and quality of digital connectivity influence not only the volume of exports but also the capacity of firms to innovate and differentiate their service offerings.

Empirical studies confirm that enhanced digital infrastructure correlates with increased participation in global value chains for services. In particular, broadband density and internet quality are linked to higher productivity in services and greater trade intensity in digitally enabled sectors [1], [9]. For instance, in developing economies, improvements in digital infrastructure have been shown to reduce information asymmetries and facilitate trust-building in remote service delivery, enabling small firms to overcome traditional market access barriers [4], [18].

In addition to physical connectivity, digital infrastructure includes institutional components such as access to cloud platforms, digital payment systems, and cybersecurity readiness. These components enable transaction security, data management, and

scalability—key factors in sustaining competitiveness in the export of services [2], [5]. Investments in these digital foundations are positively associated with export diversification and resilience, especially during economic disruptions such as the COVID-19 pandemic.

Despite these advantages, significant gaps remain across regions, particularly in Sub-Saharan Africa, parts of Southeast Asia, and Latin America, where digital infrastructure investment has lagged. This uneven access exacerbates existing trade inequalities and limits the participation of many countries in the global services economy [17], [18]. Thus, while digital infrastructure is essential to competitiveness, its absence constitutes a significant barrier to equitable growth in service exports.

3.2. Firm-Level Digital Capabilities

Beyond national infrastructure, firm-level digital capabilities play a decisive role in enhancing the competitiveness of exported services. These capabilities refer to the technological competencies, digital strategies, and organizational routines that enable firms to leverage digital tools for innovation, efficiency, and market expansion. Firms that integrate technologies such as cloud computing, big data analytics, artificial intelligence (AI), and automation into their business models tend to outperform their peers in international service markets [6], [10].

Digitally mature firms are more agile in responding to shifting consumer preferences, especially in services that require customization and rapid delivery. These firms often rely on digital platforms to facilitate customer engagement, manage logistics, and scale operations internationally [19], [20]. For example, service exporters in sectors such as software development, digital marketing, and online education use platforms like Upwork, Fiverr, and Coursera to access global markets without intermediaries. Platform participation also allows for iterative feedback, continuous improvement, and co-creation with clients—key elements of service competitiveness in the digital age.

Moreover, the ability to generate, analyze, and act upon real-time data enhances decision-making and operational efficiency. Firms with strong data analytics capabilities can optimize pricing, personalize offerings, and anticipate demand trends in international markets [21], [22]. This data-driven approach not only increases customer satisfaction but also contributes to long-term value creation and export retention.

Organizational agility, defined as the firm's ability to reconfigure processes in response to digital disruption, is also identified as a critical capability. Agile firms are better positioned to adopt emerging technologies and respond to regulatory or market shifts across countries [23], [24]. These competencies become especially vital

in navigating the uncertainties of global digital trade, where policy fragmentation, cybersecurity threats, and platform gatekeeping remain persistent challenges.

However, the development of digital capabilities is uneven across firms, particularly in developing economies where small and medium-sized enterprises (SMEs) often lack the financial, technical, or human resources to adopt advanced digital tools [2], [25]. This disparity in digital maturity can widen the competitiveness gap in service exports, reinforcing structural disadvantages at both firm and country levels.

3.3. Regulatory and Institutional Environments

The competitiveness of exported services in the digital economy is shaped not only by technological or firm-level factors but also by the regulatory and institutional frameworks that govern digital trade. These frameworks include data protection laws, cross-border data flow agreements, intellectual property rights, digital taxation, and the legal recognition of digital signatures and contracts. Countries that offer a transparent, interoperable, and innovation-friendly regulatory environment are more likely to attract investment and facilitate the smooth exchange of digital services across borders [1], [4].

The legal governance of data is one of the most critical issues affecting digital services exports. Regulatory asymmetries between jurisdictions—for example, the European Union's General Data Protection Regulation (GDPR) versus more lenient frameworks in other regions—create uncertainty for service providers operating internationally. While strong data governance can enhance user trust, excessive restrictions on cross-border data flows may raise compliance costs and limit service scalability [11], [26]. Firms must navigate these divergent rules carefully to avoid operational or legal disruptions when serving clients in multiple countries.

Digital trade agreements (DTAs) are emerging as tools to harmonize and facilitate cross-border service flows. Agreements such as the Digital Economy Partnership Agreement (DEPA) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) include provisions on data sharing, source code non-disclosure, e-commerce facilitation, and regulatory cooperation, offering a more predictable environment for digital service exporters [13], [27]. Such mechanisms have the potential to reduce non-tariff barriers and promote fair competition, especially for small and medium-sized enterprises seeking global access.

At the domestic level, institutional readiness—measured by e-government services, public sector digitalization, and enforcement capabilities—also plays a role in shaping service export potential. Governments that support digital entrepreneurship through tax

incentives, startup hubs, and education policies tend to nurture ecosystems that are more competitive internationally [2], [18]. In contrast, regulatory fragmentation, unclear jurisdictional authority, or protectionist measures can stifle innovation and erode global trust.

Cybersecurity frameworks are another important institutional factor. As digital services rely on the storage and transmission of sensitive data, the credibility of a country's cybersecurity regulations can influence foreign client confidence. Countries lacking robust legal instruments to deter data theft, online fraud, or service disruptions are less likely to be perceived as secure digital partners [4], [5]. Thus, institutional quality and regulatory coherence are integral components of long-term service competitiveness.

3.4. Structural Barriers and Risks

While digitalization offers unprecedented opportunities for expanding service exports, numerous structural barriers and systemic risks continue to constrain global competitiveness, particularly in low- and middle-income countries. These constraints are multidimensional, spanning infrastructural deficits, skill shortages, financial limitations, institutional weaknesses, and dependency on dominant digital platforms. Together, these factors contribute to an uneven global landscape in which the benefits of digital trade are asymmetrically distributed [2], [18].

A persistent digital divide remains one of the most visible barriers to service export competitiveness. In many developing regions, access to high-speed internet, secure digital infrastructure, and affordable digital tools remains limited. Such infrastructural deficiencies impede the capacity of local firms to deliver services reliably or at scale, and they restrict the ability of workers to participate in global freelance or remote work platforms [4], [17]. Moreover, underinvestment in digital skills—especially among youth and microenterprises—further reduces the readiness of these economies to engage in service-oriented digital globalization.

Another key structural issue is platform dependency. The dominance of a small number of digital platforms—such as Amazon Web Services, Google Cloud, and Meta—poses a risk to service exporters, who may become overly reliant on platform algorithms, terms of service, and monetization schemes beyond their control. This concentration of market power can stifle competition, extract disproportionate value from smaller players, and introduce vulnerability to sudden policy changes or account suspensions [12], [19]. Furthermore, the opaque nature of algorithmic governance raises questions of fairness, transparency, and accountability in cross-border service trade.

Cybersecurity and privacy threats represent another category of risk. Many service exporters operate in data-intensive environments that involve sensitive customer information. In the absence of strong legal protections or cyber incident response frameworks, these firms are exposed to risks that can damage client trust and lead to reputational and financial losses. A lack of international alignment in cybersecurity standards further complicates operations for firms engaged in multi-jurisdictional service delivery [5], [11].

Finally, regulatory uncertainty and geopolitical tensions can act as indirect but significant structural inhibitors. Trade restrictions, digital sovereignty claims, and growing digital protectionism may fragment global markets and discourage cross-border collaboration. For instance, escalating tensions between major economies have led to divergent regulatory regimes around data localization and platform access, limiting interoperability and complicating compliance for exporters [13], [26]. As such, structural barriers are not only rooted in technology or infrastructure, but also in the broader political economy of the digital age.

3.5. Discussion

The findings of this review underscore the multifaceted nature of competitiveness in digitally exported services, revealing how technological, organizational, regulatory, and structural dimensions interact to shape outcomes in the global digital economy. At the core lies the essential role of digital infrastructure. Access to reliable broadband, cloud computing services, mobile networks, and digital payment systems not only facilitates the delivery of services across borders but also acts as a multiplier for innovation, entrepreneurship, and market scalability. Economies that have invested in such foundational systems have observed faster growth in digitally deliverable services and greater resilience during crises such as the COVID-19 pandemic, while countries with lagging infrastructure face compounded disadvantages in participating in global digital trade [17], [18].

Yet infrastructure alone is insufficient. Competitiveness in digital services also hinges critically on firm-level digital capabilities, including technological agility, data literacy, platform engagement, and innovation orientation. Digitally advanced firms are more responsive to demand shifts and regulatory constraints, and they can leverage platform ecosystems to access new markets without incurring traditional export costs. These firms are also better equipped to personalize services, adopt automation, and generate insights from customer data—capabilities increasingly central to success in digitally mediated trade [6], [10]. However, the uneven distribution of these capabilities across firms, especially in small and medium enterprises (SMEs), reflects broader disparities in skills, finance, and

strategic vision. This digital capability gap—amplified in developing regions—limits the depth and inclusiveness of service export growth.

Regulatory environments further mediate these dynamics. Countries that provide clarity, interoperability, and trust-enhancing legal regimes—such as cross-border data flow agreements, cybersecurity laws, and digital signature recognition—facilitate smoother integration into global service networks. Emerging digital trade agreements (DTAs) provide templates for reducing legal frictions and aligning standards, yet vast asymmetries remain. Regulatory fragmentation, especially between major digital powers, creates uncertainty and complexity for firms operating in multiple jurisdictions. Additionally, divergent approaches to data governance—ranging from the open data flows of the U.S. to the data sovereignty models of the EU and China—pose systemic challenges for platform-dependent exporters and multinational service providers [11], [13].

Structural risks, meanwhile, present deep-rooted constraints. Persistent digital divides, cyber insecurity, and platform monopolies collectively undermine fair participation and long-term sustainability in digital service trade. The dependence on dominant platforms exposes firms to opaque algorithms, changing monetization policies, and geopolitical risks, all of which can reduce business autonomy and erode bargaining power. Moreover, the lack of robust cybersecurity and consumer data protection in many jurisdictions weakens international trust and may lead to service exclusion in more tightly regulated markets. These structural frictions are further compounded by political tensions and digital protectionism, which can splinter the global digital commons and restrict the free flow of services and data [2], [12].

Taken together, the findings suggest that digital competitiveness in service exports is increasingly defined by a country's or firm's ability to coordinate across technical, regulatory, and strategic domains. Policies should thus focus not only on closing infrastructure gaps but also on fostering firm-level digital maturity and advancing institutional harmonization. Governments need to prioritize capacity-building for SMEs, invest in digital skills development, and pursue bilateral or multilateral frameworks that align digital trade regulations and cybersecurity norms. Concurrently, research should examine the causal mechanisms through which digital tools and policies influence trade outcomes, explore the impact of platform dependency on firm performance, and assess how AI and data-driven services alter traditional trade models. There is also a need to investigate the intersection of sustainability and digital services, particularly as environmental regulations increasingly influence international business practices.

Taken together, digitalization reconfigures the landscape of global competitiveness in services, expanding opportunities while intensifying disparities. Those economies and enterprises that can successfully mobilize infrastructure, build capabilities, navigate regulation, and mitigate risk will be best positioned to thrive in an era where service trade is no longer bound by geography but shaped by code, connectivity, and coordination.

4. Conclusion

Digitalization is fundamentally reshaping the global landscape of service exports by lowering transaction costs, expanding market reach, and enabling service innovation at scale. However, competitiveness in this evolving environment is no longer determined solely by factor endowments or cost efficiency, but by the alignment of digital infrastructure, firm capabilities, regulatory clarity, and systemic resilience. Economies and enterprises that integrate digital tools with agile strategy, invest in skills and data capabilities, and engage in harmonized governance frameworks will be best positioned to capture value in cross-border service trade. Yet, persistent digital divides, regulatory fragmentation, and platform dependency present critical challenges that threaten to widen global disparities. Bridging these gaps requires coordinated policy action, capacity building for small firms, and renewed global cooperation on digital trade norms. Future research should further explore the dynamic interactions between technology, institutions, and firm behavior in the context of global service competitiveness, with particular attention to inclusivity, sustainability, and governance in the digital economy.

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