

“The global digital economy market development through the prism of Porter’s Five Forces model”

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THE GLOBAL DIGITAL ECONOMY MARKET DEVELOPMENT THROUGH THE PRISM OF PORTER'S FIVE FORCES MODEL

Abstract

The rapid pace of digitalization is radically transforming the global economy, necessitating a rethinking of traditional competitive strategies. Accordingly, the purpose of this study is to advance the classical principles of Porter's Five Forces model for assessing the competitive environment of the global digital economy. The paper proposes a refined interpretation of the competitive forces: threat of new entrants, bargaining power of suppliers, bargaining power of buyers, threat of substitutes and innovations, and the intensity of competitiveness within the global digital market. An expert-based methodology, supported by our evaluation framework, was applied to explore and characterize these competitive forces, comprising 25 indicators of competitive intensity and complemented by a comprehensive SWOT analysis.

The empirical foundation for the qualitative and quantitative assessment was drawn from international rankings and indices published by leading organizations and research institutions between 2020 and 2022. The qualitative and quantitative assessment findings indicate that the global digital economy exhibits high dynamism and intense competition, and market structure transformation. The SWOT analysis underscores substantial growth potential driven by demand, scalability, and innovation, while highlighting critical challenges related to cybersecurity, regulatory gaps, market concentration, and equitable access to digital resources.

Integrating the evaluation of competitive forces with SWOT insights allows for systematic identification of strategic development pathways, supporting evidence-based managerial and policy decisions at both national and international levels. The study emphasizes the need for empirical validation and further research on the evolving dynamics of competitiveness in the global digital era.

Keywords

economy, Porter's five forces model, competitiveness,
digitalization, innovation, global markets,
transformation, strategy, market

JEL Classification

F10, O11, O33

INTRODUCTION

The global economy is experiencing a profound and accelerating transformation driven by technological advancement and the widespread digitalization of economic and social systems. These transformations are underpinned by the diffusion of information and communication technologies (ICTs), the intensification of global connectivity, and the rapid expansion of digital platforms. These developments have fostered the emergence of a global digital environment characterized by intensive information flows and the pervasive influence of digital transformation across all sectors of economic activity. Consequently, digital technologies are reshaping production, consumption, and competition patterns.

The digital economy is increasingly marked by cross-sectoral technological convergence, evolving supply and demand dynamics, and the reconfiguration of markets, business models, and consumer behavior.

Within this context, Kazakhstan's trajectory exemplifies the strategic relevance of digitalization as both a catalyst and a prerequisite for deeper participation in global economic processes. Achieving sustainable competitiveness in this environment requires not only the adoption of advanced digital infrastructures but also the development of comprehensive strategic management frameworks and methodological instruments capable of steering systemic digital transformation toward innovation-driven and inclusive growth.

However, this transformation is accompanied by a set of emerging systemic challenges. Among the most critical are growing digital inequality, the increasing monopolization of digital markets by large platform-based corporations, and the growing dependence on digital infrastructure, which collectively introduce new dimensions of systemic risks. Technological failures can lead to significant disruptions across sectors, while ethical concerns related to algorithmic bias and data misuse are becoming increasingly pronounced (Waleed, 2024).

Furthermore, environmental externalities, including the escalating generation of e-waste and the high energy intensity of digital infrastructures, add further layers of complexity to the sustainability agenda (Ren & Zhang, 2023). At the same time, issues of data sovereignty and the protection of personal information are emerging as pivotal elements of the global policy and governance discourse (Kozlov & Tomashevskaya, 2021).

The central scientific problem addressed in this study lies in the need for a systematic understanding of how digitalization restructures competitive dynamics, market behavior, and the institutional foundations of economic activity. Achieving sustainable, inclusive, and ethically grounded development in the digital realm requires an in-depth analysis of the multifaceted factors that shape its evolution. The formation of a coherent digital environment, supported by robust scientific and methodological frameworks for managing national digital economies, has become a prerequisite for enhancing national digital competitiveness. This necessity is driven by the infocommunication characteristics of emerging technologies and their capacity to induce structural transformations across industries and markets (Kozlov & Tomashevskaya, 2021).

1. THEORETICAL BASIS

The conceptualization and evolution of the digital economy have been the focus of sustained scholarly debate and theoretical refinement. A unified international framework for defining the "digital economy" has not yet been established due to its complexity and ongoing transformation. The concept reflects the economic nature of the digital economy as one that relies on digital technologies and integrates resources, knowledge, and ICTs (Tapscott, 1996; Negroponte, 1996; Colin et al., 2015; Kane et al., 2015; European Parliament, 2015; Tugui, 2015; Paniczok et al., 2021). It serves as both a result and a driver of innovation in economic and social systems (Brynjolfsson & McAfee, 2014). Digital economy includes the advancement of e-business and e-commerce (Economist Intelligence Unit, 2010; OECD, 2013; Fayyaz, 2018), automating data processing and organiz-

ing digital workflows (Tugui, 2009; Gorelova et al., 2010), a network-based economy shaped by digital flows and distributed interactions (Barefoot et al., 2018), and a synthesis of real-sector production and digital platforms (Dykan et al., 2018). In addition, it represents a new segment of economic relations based on digital resources and services. The digital economy is conceptualized as a new paradigm of economic management grounded in data-driven processes, digital technologies, and network-based interactions.

Digital transformation and digital advancement are examined at the level of the entire system of social relations, both through a result-oriented lens and within the framework of a process-based approach (Paniczok et al., 2021). Within the results-oriented framework, digitalization is understood as the set of transformative changes induced by digital technologies across all dimensions of

human activity (Stolterman & Fors, 2004). It is examined through the lens of leveraging emerging digital tools to enhance the effectiveness of traditional technologies, foster new forms of customer engagement, streamline organizational processes, and refine value propositions (Westerman et al., 2011). Moreover, digitalization is conceptualized as the strategic application of advanced technologies, such as social media, mobile platforms, data analytics, and embedded systems, to fundamentally improve business operations and organizational performance (Fitzgerald et al., 2013). The results-based approach views digitalization primarily through its outcomes: greater efficiency, higher value, and improved quality across processes, products, and services.

From the perspective of the process-oriented approach, digital transformation is understood as an ongoing, deliberate process of generating new value through the active engagement of all stakeholders and business models. This approach encompasses the integration of economic and social domains, the transformation of data into meaningful insights, the utilization of ICT to enable opportunities that transcend automation, the digital advancement of business models and innovation pathways, and the strategic restructuring of supply chains (Bowersox et al., 2005; Martin, 2008; Mazzone, 2014; Tratkowska, 2019; Paniczok et al., 2021; Wang, 2022).

The digital economy, technology integration, data, and innovation are becoming a core driver of global development, sustainability, and competitiveness. Through ICT, digital production, e-business, and e-commerce, it increases efficiency, improves interaction between actors, and generates new opportunities. By shaping a new institutional environment, digitalization not only enhances national competitiveness but also strengthens adaptability to dynamic economic and technological challenges.

Recent studies call for the revision of Porter's (1980) Five Forces Model to capture the evolving patterns of competition and value creation in the digital economy. Technologies reduce entry barriers, increase buyer power, and foster substitution through digital alternatives. Digital tools ease market entry, while information availability

enhances consumer influence (McKinsey Global Institute, 2019). Moreover, suppliers increasingly rely on data analytics and platforms to reshape their strategies (Kenny & Zysman, 2021).

According to Schwab (2016), technological advancements are reshaping all five of Porter's competitive forces, fundamentally altering the dynamics of competition and the nature of firm-customer relationships. Digital transformation facilitates the rise of non-traditional competitors, diminishes the strategic significance of physical infrastructure, and places increasing emphasis on service quality and customer experience as primary sources of competitive advantage. Schwab (2016) further notes that the technological disruptions inherent in the digital economy transform the very conditions of competition by lowering physical and informational barriers and redefining the relationship between firms and consumers. Consequently, the traditional boundaries that once delineated industries are becoming increasingly porous, necessitating a reconceptualization of sustainable competitive advantage in a digitally interconnected environment.

Data-driven personalization, as conceptualized by Zuboff (2019), substantially amplifies buyer power by enabling digital platforms to anticipate and fulfill consumer needs with remarkable precision while simultaneously enhancing market transparency and facilitating the comparison of alternative offerings. The intensification of competition in digital markets compels firms to enhance both price efficiency and product quality, while the rise of personalization shifts the competitive paradigm from cost-based rivalry to value-driven differentiation. Data analytics and individualized product design amplify buyers' bargaining power by enabling firms to anticipate and satisfy customer preferences with unprecedented accuracy. Platforms that leverage large-scale data collection and interpretation thereby consolidate their strategic position within market ecosystems, often redefining the boundaries between producers, intermediaries, and consumers. Simultaneously, the transparency afforded by digital technologies facilitates real-time comparison of offerings, further increasing competitive pressure and accelerating market adaptation cycles. Consequently, traditional sources of competitive advantage, such as

cost leadership and scale, are being supplanted by dynamic capabilities focused on agility, innovation, and sustained customer engagement.

Digitalization significantly lowers entry barriers for new market participants, facilitating the emergence of innovative and agile competitors. This transformation in the competitive landscape has prompted scholars to re-examine the relevance and adaptability of classical strategic models within the context of evolving technological paradigms. In particular, new digital technologies like online platforms and cloud computing allow small and medium-sized companies to compete with large players (Brynjolfsson & McAfee, 2014). The integration of advanced automation technologies and machine learning algorithms enables new entrants to develop dynamic capabilities that facilitate rapid adaptation to shifting market demands and the delivery of personalized value propositions. This technological agility not only enhances their innovation capacity but also strengthens their competitive positioning within increasingly data-driven and customer-centric digital markets.

The proliferation of platform-based business models and digital ecosystems is fundamentally reshaping market structures by diminishing the role of traditional intermediaries, fostering direct producer-consumer interactions, and consolidating the strategic influence of platform owners. As these ecosystems expand, conventional supply chains become increasingly disintermediated and streamlined, giving rise to new configurations of value creation and coordination. Within this context, the traditional concept of supplier power requires reconsideration, as digital platforms not only redefine the boundaries between suppliers and producers but also introduce new dependencies shaped by data ownership, algorithmic control, and access to digital infrastructure.

The utilization of big data alters the negotiating power of suppliers within the digital economy. In the digital economy, suppliers capable of effectively managing data and technology have a significant influence on the market (Mayer-Schönberger & Cukier, 2013). This influence becomes particularly salient in business-to-business (B2B) sectors characterized by pronounced digital dependence, where control over data flows and technological

infrastructure increasingly determines competitive advantage. At the same time, digitalization reduces the dependence of companies on traditional suppliers, as global platforms offer alternative solutions, for example, through distributed production models or digital supply chains, which weakens the monopoly position of individual suppliers. Digitalization allows diversification of supplies and expansion of the pool of counterparties, reducing dependence on individual suppliers or monopolies (Razumkov Centre, 2020).

These arguments demonstrate how digitalization reconfigures Porter's Five Forces framework by modifying the relative influence of each force and introducing new mechanisms of competitive interaction. Consequently, the evolving dynamics of the digital economy drive the need for the adaptation of business strategies and the reconsideration of regulatory frameworks to ensure alignment with ongoing technological and market transformations (Porter, 1980).

Digitalization is transforming the structure of competition, creating new market niches and changing the mechanisms of interaction between companies, suppliers, and consumers. There is a transition from linear models to networked configurations based on platform interactions and data. Today, business success depends on strategic adaptability, rapid responsiveness to market and technological changes, and the use of data and digital platforms as competitive assets.

Parker et al. (2016) examine the transformative impact of digital platforms on competitive dynamics, emphasizing their capacity to enable rapid scalability and market dominance, as exemplified by firms such as Amazon, Uber, and Airbnb. Platform-based enterprises cultivate dynamic digital ecosystems in which competitive advantage derives not solely from technological innovation but also from the ability to integrate users, suppliers, and data flows into cohesive, self-reinforcing networks.

Brown and Markous (2020) explore how digitalization is reshaping the nature of substitute goods, thereby altering competitive dynamics and transforming market structures. Their research highlights that the principal drivers of

digital substitution, convenience, personalization, and the accessibility of digital solutions, enhance the attractiveness of digital alternatives over traditional counterparts. Thus, these developments underscore that digitalization is fundamentally redefining the competitive landscape, creating both opportunities and challenges for firms, while influencing competitiveness and strategic orientations across diverse industries.

The extant body of research indicates that, although the digital economy has been the subject of extensive theoretical and empirical inquiry, its inherent characteristics, multidimensional dynamics, and evolutionary complexities continue to necessitate comprehensive scholarly interrogation. Despite the proliferation of studies in this domain, conceptualizations of its structural configuration and transformative trajectories remain methodologically fragmented and analytically incongruent. In its broadest interpretation, the digital economy may be conceived as a system of economic relations predicated upon the pervasive diffusion of digital technologies, the convergence of information and communication infrastructures, and the emergence of platform-driven innovation. Functioning as an intricate socio-economic construct, it redefines the modalities of production, distribution, and institutional interaction within contemporary market systems.

Against identified research gaps, we apply Porter's Five Forces model to the context of the global digital economy, aiming to conceptualize and assess how digital transformation redefines market structures, alters competitive intensity, and generates new paradigms of value creation and strategic behavior within digitally driven economic systems.

2. RESULTS

International experience underscores the pivotal role of digitalization processes in contemporary economic development. Establishing a robust analytical foundation for formulating and selecting effective strategies for the digital economy necessitates, as a preliminary step, a thorough evaluation of the existing conditions.

The digital economy has emerged as a key driver of global growth, currently accounting for over 15% of world GDP and expanding at a pace approximately 2.5 times faster than the aggregate global economy. By 2021, its estimated value reached USD 14.5 trillion (World Economic Forum, 2022). Projections indicate that by 2030, digital economic activities will comprise nearly 30% of global GDP and generate approximately 30 million new jobs, with close to 70% of incremental value creation attributable to platform-based business models (Digital Cooperation Organization, 2024; Ghosh & Ramalingam, 2022). In parallel, World Bank estimates suggest that digital technologies could contribute up to 1.7% to the European Union's GDP by 2025 – through gains associated with broadband diffusion (1.7%), expanded international bandwidth (0.66%), and e-commerce growth (0.88%) – representing an annual addition of roughly EUR 415 billion to the European economy (World Bank, 2021).

Empirical evidence from the newer EU member states indicates that late adopters of digital transformation benefit from a broader portfolio of mature and cost-efficient technologies available for prioritized deployment. This technological flexibility enables them to accelerate the pace of structural transformation, thereby shortening the digitalization trajectory relative to early-mover economies (World Bank Group, 2021). This involves the formulation of robust strategies for the development of digital markets at both global and national scales, designed to leverage the competitive advantages inherent in the digital economy while systematically accounting for the structure and dynamics of the competitive environment.

Accordingly, the traditional elements of Porter's Five Forces framework, comprising the bargaining power of suppliers, the bargaining power of buyers, the threat posed by new entrants, the threat of substitute products and innovations, and the intensity of intra-industry competition, have been systematically adapted to the structural and functional characteristics of the digital economy. A comprehensive qualitative assessment of the competitive environment within the global digital economy is provided in Appendix A, Figure A1, illustrating the specific mechanisms through which digitalization reshapes market dynamics.

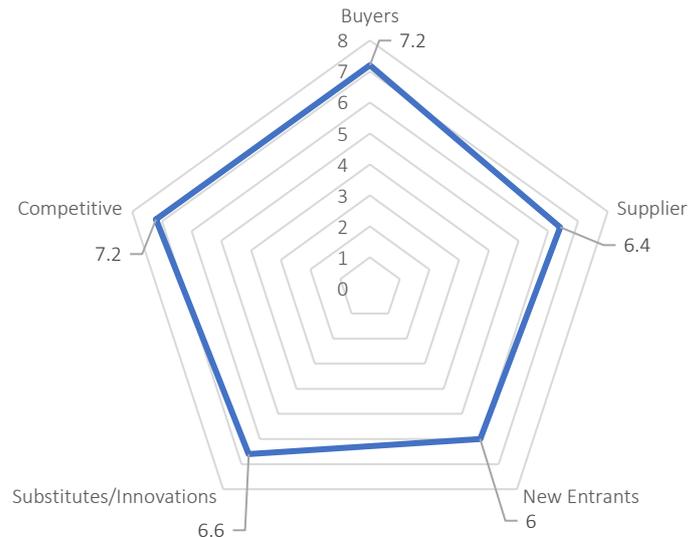


Figure 1. Porter's Five Forces assessment of the global digital economy

For the quantitative evaluation, an expert-based methodological approach was employed, underpinned by a comprehensive information base comprising international rankings and indices from leading organizations and research institutions for the period 2020–2022. These sources capture critical trends in digitalization, the emergence of competitive advantages, and the structural transformation of markets in the global digital economy. They include the World Digital Competitiveness Ranking, Digital Evolution Index, Digital Quality of Life Index, ICT Development Index, Global E-Government Development Index, E-Participation Index, Global Information Technology Report, Global Innovation Index, Networked Readiness Index, Digital Readiness Index, Global Connectivity Index, National Cyber Security Index, and World Competitiveness Ranking.

In this framework, each of Porter's Five Forces was systematically evaluated using a ten-point ordinal scale (1–10), based on five carefully defined indicators per force, resulting in a total of 25 metrics. The intensity of each competitive force was classified into three discrete categories: low (1–<4), medium (≥ 4 –<7), and high (≥ 7 –10). The arithmetic mean of the five indicators per force provides a quantitative measure of its influence on the competitive environment of the digital economy. This structured approach ensures methodological transparency and allows for the systematic comparison of forces across different digital contexts.

The complete evaluation matrix and results of the assessment of global digital economy competitive forces are provided in Appendix B, Table B1. High values (≥ 7 –10) indicate strong competitive pressure, requiring the development of measures to enhance resilience and adaptability; medium values (≥ 4 –<7) reflect balanced influence, suggesting strategies aimed at optimization and strengthening of market positions; and low values (1–<4) indicate weak pressure, creating conditions for expansion and consolidation in the market.

To provide a clear visual representation, the results of the evaluation for each of Porter's Five Forces are depicted in Figure 1 and are subsequently summarized.

The analysis of the global digital market, based on an adapted Porter's Five Forces framework, highlights several key dynamics. Low entry barriers, such as widespread Internet access, technological availability, and rapid innovation, continue to attract new entrants, though incumbents maintain significant advantages through brand equity, network effects, and access to capital (New Entrant Power: 6.0/10). The broad availability of technology and service providers limits supplier influence (Supplier Power: 6.4/10), whereas buyers retain substantial leverage due to extensive product choice and ease of comparison, a trend expected to intensify with growing competition and declining Internet costs (Buyer Power: 7.2/10). The rapid pace of technological advancement sustains

Table 1. Analysis of strengths, weaknesses, opportunities, and threats (SWOT analysis) of the global digital economy

Strengths	Weaknesses
<ul style="list-style-type: none"> • High demand for digital products and services in the modern market environment • Speed and efficiency • Global access • Automation and optimization • Innovation and development of new technologies • Analytics and data • Low cost of entry into business and availability of technologies with a high level of scaling of business models 	<ul style="list-style-type: none"> • Digital accessibility and digital divide • Data security • Technology dependence • Science and education • Lack of standards and regulations • Insufficient number of qualified IT specialists • Risk of market monopolization by digital platforms and deterioration of competitive conditions • Insufficient data protection and vulnerability to cyberattacks • Restricted access and elevated costs of certain digital technologies for small and medium-sized enterprises
Opportunities	Threats
<ul style="list-style-type: none"> • Growing demand for digital products and services • Development of new technologies and platforms • Development of an innovative environment • Development of e-commerce • Global interaction • Analytics and Big Data 	<ul style="list-style-type: none"> • Cybercrime • Regulatory risks • Increased competition in the market for digital services and products • Technological change • Uncertainty around future trends in technology development and their impact on the business environment • Risk of insufficient protection of intellectual property and the possibility of competitors copying technologies • Environmental risk

a persistent threat of substitution and innovation (Substitute/Innovation Power: 6.6/10), while competition among firms remains high, driven by market proliferation, technological diffusion, and the race for market share and technological leadership (Competitive Rivalry: 7.2/10). To complement this structural assessment, a SWOT analysis was conducted to synthesize the principal findings and provide a strategic overview of the global digital economy (Table 1).

The SWOT analysis underscores that the digital economy exhibits considerable growth potential, driven by robust demand, scalability, and continuous technological innovation. However, its expansion is constrained by persistent challenges, including cybersecurity vulnerabilities, regulatory deficiencies, and unequal access to digital resources. While opportunities exist for global market expansion, the development of e-commerce, and the adoption of data-driven business models, these prospects may be curtailed by intensifying competition, emerging cyber threats, and the rapid pace of technological change. Consequently, the sustainable advancement of the digital economy necessitates a careful balance between fostering innovation, ensuring security, establishing effective regulatory frameworks, and promoting inclusive access to digital infrastructure.

When integrated with the comprehensive assessment of Porter's Five Forces, these insights facilitate the identification of strategic priorities within the global digital economy. The evaluation of each competitive force delineates specific vectors of strategic action, while their combined influence forms a systemic model that captures the mechanisms of competitive adaptation under digital transformation. This integrated perspective provides a framework for guiding policy and managerial decisions, ensuring that strategic initiatives align with both market realities and technological trajectories. The resulting strategic directions are summarized in Table 2.

The assessment indicates that competitive pressure within the global digital economy is predominantly moderate to high, necessitating a strategic blend of adaptive, protective, and innovation-driven responses. Sustaining long-term competitiveness requires the reinforcement of digital ecosystems, the personalization of user experiences, and targeted investments in technological innovation and digital sovereignty. Effective strategy also entails balancing competitive dynamics with collaborative mechanisms, including strategic alliances, the integration of ESG principles, and the cultivation of synergistic digital partnerships, thereby aligning market positioning with broader systemic and technological trends.

Table 2. Strategic directions for the development of the global digital economy market

Competitive Power / Analytical aspect	Pressure level	Type of strategy	Recommended strategies
The threat of new entrants (6.0/10)	Moderate	Protective and preventive	The development of digital ecosystems as a form of organizational and economic integration that provides multiplicative network effects and brand strengthening in the face of digital competition.
The power of suppliers (6.4/10)	Moderate	Stabilizing	Diversification and digitalization of supply chains through the formation of technological partnerships and increased investment in ICT as a mechanism to strengthen technological sovereignty and reduce external risks.
The power of buyers (7.2/10)	High	Adaptive	Integrating the principles of personalization, trust, and cybersecurity into the digital service strategy as a tool for building long-term user loyalty and strengthening competitive advantages in the global market.
The threat of substitutes and innovations (6.6/10)	Moderate	Innovative and preventive	Investing in research and digital innovations aimed at creating sustainable technology platforms and protecting intellectual property, increasing the innovation capacity and sustainability of the digital market.
Competition between players (7.2/10)	High	Integrative / cooperative	Integration of investments in innovation, marketing, and brand development with the introduction of ESG approaches and the expansion of international alliances as a mechanism for sustainable growth and strengthening positions in the global digital market.

Consequently, the integrated application of Porter's Five Forces framework and SWOT analysis facilitates the identification of critical challenges and sources of competitive advantage, providing a robust foundation for the formulation of adaptive strategies at both national and global levels.

3. DISCUSSION

Our approach formalizes the quantitative evaluation of competitive forces through a standardized set of 25 indicators (five per force), contextualizes these measures within a strategic framework, integrates them with SWOT analysis, and develops a robust typology of strategic behaviors among actors in the global digital market, thereby providing a systematic tool for both empirical assessment and strategic decision-making. This approach ensures reproducibility of the results and the possibility of cross-comparative analysis, expanding the potential of Porter's Five Forces model in the digital economy.

The assessment of competitive forces in the global digital economy indicates that digitalization not only reinforces traditional market interactions but also fundamentally reconfigures the structure of competition, creating new patterns of influence and interdependence among market participants. The observed moderate-to-high pressure values (6.0–7.2) across all five of Porter's forces reflect a high intensity of competition and underscore the pivotal role of digital factors in shaping the struc-

ture and dynamics of the global market. These findings highlight the use of quantitative assessments of competitive forces as a critical instrument for strategic analysis and understanding market dynamics.

The adaptation of Porter's classic Five Forces model has revealed new patterns of interaction between competitive forces. The threat of new entrants is amplified by reducing transaction costs and expanding access to digital infrastructures; the influence of suppliers is becoming more flexible due to global diversification and platform integrations. The power of buyers is increasing due to the availability of information, the ability to compare offers, and the personalization of digital services. At the same time, digital innovations accelerate the emergence of substitutes, shorten the life cycle of products, which increases technological turbulence, giving competition a network and ecosystem character. These findings are consistent with studies highlighting the need to rethink Porter's Five Forces model in a digital context (Kızıldağ & Uğurlu, 2023; Alabi, 2025; Shen et al., 2022). Integration with SWOT analysis provided a comprehensive consideration of internal and external factors of competitiveness, which corresponds to the approaches mentioned in a number of modern studies (Öneren et al., 2017; Anton, 2015; Shen et al., 2022). The strengths of the digital economy – innovation, scalability, and global connectivity – are combined with the risks of technological dependence, digital inequality, and cyber threats. This finding reinforces the theoretical proposition

regarding the dual nature of digitalization: while it operates as a structural driver of innovation, productivity, and market efficiency, it simultaneously generates new forms of systemic fragility, algorithmic dependency, and institutional vulnerability within digital ecosystems. Such an ambivalent impact aligns with the conceptual frameworks and empirical evidence presented by the OECD (2013), Acemoglu and Restrepo (2022), Zuboff (2019), and the IMF (2024). The high intensity of competition in the global digital economy necessitates the formulation of adaptive strategies, consistent with contemporary research highlighting the management of digital ecosystems and the transition from traditional competitive models to cooperative network-oriented approaches (Goyal, 2020; Shen et al., 2024). By operationalizing Porter's Five Forces through a quantitative framework, it becomes possible to move beyond descriptive analysis toward actionable strategic insights. The resulting evaluation informs a typology of strategic behaviors that captures the systemic mechanisms through which market participants adjust to evolving competitive pressures. This approach aligns with the methodological contributions of Shvindina and Shkurko (2015), Jung and Jeong (2022), and Paksoy et al. (2023), while the integration of Porter's framework with SWOT analysis further enables the selection

of contextually appropriate strategies, as demonstrated by Öneren et al. (2017), Anton (2015) and Shen et al. (2022). Collectively, this integrated framework provides a robust basis for both empirical assessment and strategic decision-making in digitally transforming markets.

Digitalization does not abolish traditional mechanisms of competition; rather, it reconfigures them, embedding networked, technological, and institutional dimensions into market dynamics. This study makes a distinct contribution by adapting Porter's Five Forces framework to the realities of the digital economy, operationalizing it through a quantitative set of indicators, and integrating it with SWOT analysis to provide a comprehensive, empirically grounded tool for strategic assessment. This approach advances prior research by offering a systematic methodology for analyzing how digitalization reshapes competitive forces, influences market interactions, and informs strategic decision-making. The resulting framework enables policymakers and business leaders to design targeted, evidence-based digital transformation programs, strengthen competitive positioning, and enhance national and global economic competitiveness within rapidly evolving digital ecosystems.

CONCLUSION

The purpose of this study was to analyze the global digital economy market through the prism of Porter's Five Forces model to assess the competitive environment of the modern digital economy.

The use of Porter's adapted Five Forces model has shown that digitalization significantly transforms the competitive environment, changing traditional market dynamics and redistributing power between participants. The qualitative assessment of the global digital economy, based on Porter's Five Forces model, revealed that barriers to market entry are decreasing, contributing to the influx of new participants. The influence of traditional suppliers is decreasing due to global diversification and platform solutions. In addition, buyers are increasing their impact due to awareness and the growth of personalized solutions. Substitutes become more threatening, accelerating innovation processes. Competition is intensifying, requiring significant digital investments and the development of ecosystem interaction. Finally, digitalization simultaneously creates new growth opportunities and the need for flexible strategic management.

A quantitative assessment of the five competitive forces revealed a high intensity of competitive interactions and the interdependence of market participants, which requires a transition from isolated competitive strategies to ecosystem forms of cooperation and innovative partnership. Thus, digital transformation not only enhances competition but also stimulates the formation of flexible strategic models aimed at increasing the sustainability and adaptability of digital economies.

The prospects for further research are related to an in-depth analysis of the industry-specific features of digital transformation and the development of methodological tools for assessing the impact of artificial intelligence, big data, and other digital technologies on competitive forces. In addition, an important area is the integration of strategic analysis approaches with digital economy and risk management tools.

AUTHOR CONTRIBUTIONS

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APPENDIX A

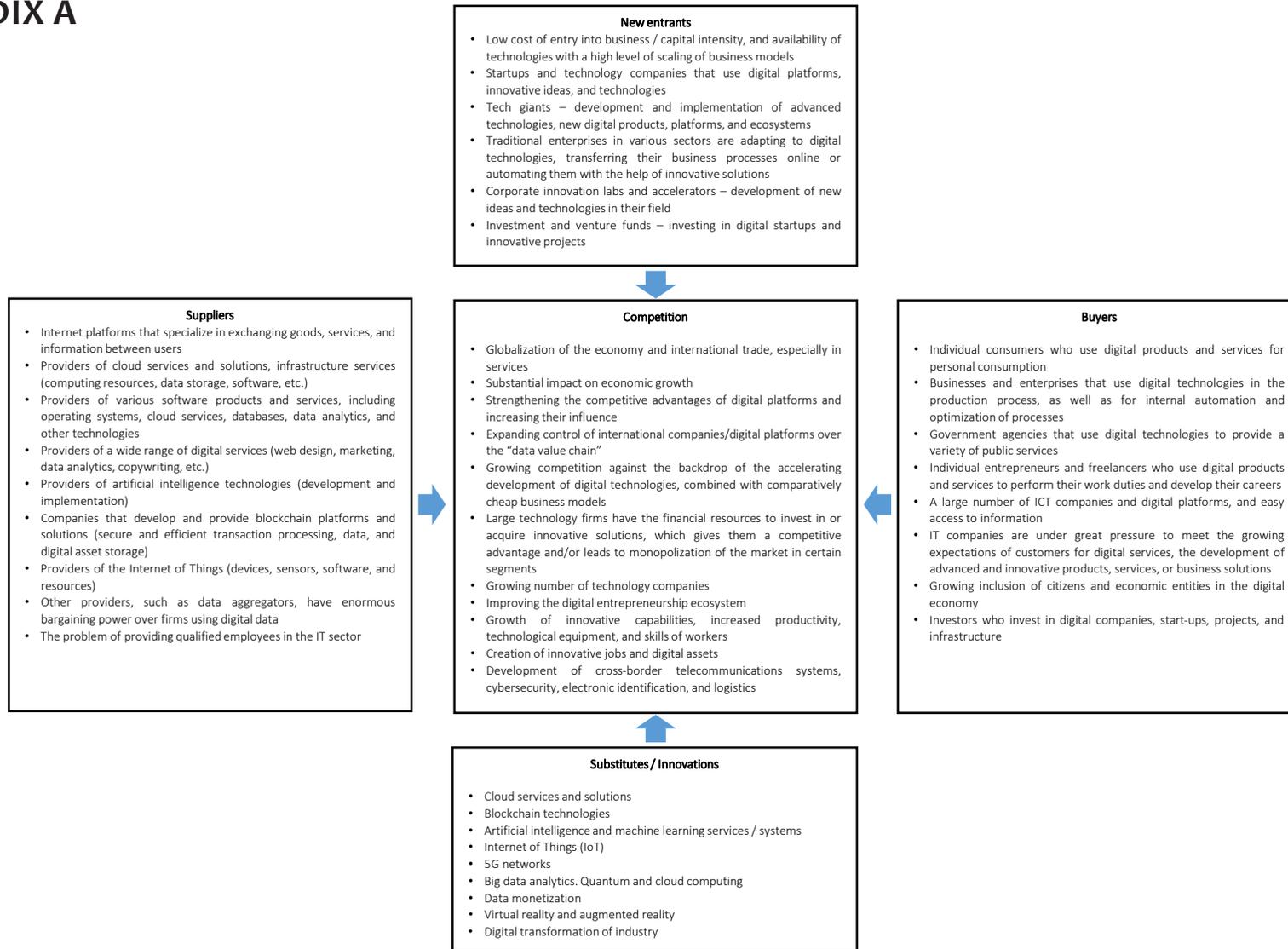


Figure A1. Implementation of Porter’s Five Forces concept for assessing the competitive environment in the international digital market

APPENDIX B

Table B1. Results of Porter's Five Forces assessment of the global digital economy

PORTER'S FIVE FORCES – ASSESSMENT SHEET		
Buyers		
1	Capacity of supply compared to demand	Exceeds demand – 8
2	Availability of information, goods, or services to consumers	Medium – 7
3	Buyers' ability to buy or integrate digital goods or services	Medium – 7
4	Buyers' ability to neutralize market speculation	Medium – 7
5	Level of supplier-buyer concentration	Balanced – 7
Buyer Power Assessment		7.2
Suppliers		
1	Do suppliers have sufficient capacity to meet market demand	Capacity shortage – 3
2	Is the market dominated by a few suppliers?	Yes – 8
3	Can buyers find alternative products/suppliers?	Sometimes – 6
4	Suppliers have the ability to set prices, terms of sale, and other aspects of market relations in their favor	Yes – 8
5	Level of supplier-buyer concentration	Sometimes – 7
Assessment of Suppliers' Strength		6.4
New Entrants		
1	Legislative restrictions and restrictive regulations	Sometimes – 5
2	Probability of new products, services, tools, and technologies	High – 8
3	Cost of entering the business (initial capital investment)	Low – 8
4	Loyalty to brands / trademarks of the industry	High – 3
5	Availability of own technologies	Sometimes – 6
Assessment of New Entrants' Strength		6.0
Substitutes / Innovations		
1	Presence of entry barriers (licenses, patents, copyrights, etc.).	Sometimes – 6
2	Customer brand loyalty / Willingness or ability of consumers to switch to alternative products or services	Medium – 6
3	Cost of entry	Low – 8
4	Access to distribution (market positioning and control over channels of distribution of products or services).	Medium – 6
5	Do new products have the potential to satisfy a variety of consumer needs and benefits, not only limited to economic ones	Insignificant added value – 7
Assessment of the strength of Substitutes/Innovations		6.6
Competition		
1	Presence of significant barriers to entry and exit	Limited – 6
2	Impact of regulatory actions (national and international) on competition	Limited – 6
3	Market growth rate	Rapidly expanding market – 8
4	Number of market participants	High – 8
5	Level of differentiation of products and services	High – 8
Assessment of competition between players		7.2