



DIGITALIZATION'S INFLUENCE ON THE TRANSFORMATION OF UKRAINE'S SOCIO-ECONOMIC PROCESSES

Halyna Vasylevska, David Whaley, and Mahdi Safa

Abstract

Purpose - This study examines how digital transformation strengthens fiscal resilience and administrative continuity in Ukraine under conditions of large-scale wartime disruption. The research addresses the structural challenges caused by infrastructure destruction, institutional pressure, and the need to sustain socio-economic stability during armed conflict. The paper aims to evaluate digitalization as a strategic mechanism for reinforcing state fiscal security and institutional adaptability.

Methodology - The study applies a systems-based analytical framework combining scientific abstraction, comparative analysis, and deductive reasoning. Empirical analysis uses time-series data for 2014–2025. Methodological triangulation and third-degree polynomial regression are employed to assess the relationship between GovTech implementation and fiscal resilience.

Findings - The findings show that public-sector digitalization has become a key driver of Ukraine's institutional resilience. Regression analysis reveals a strong correlation ($R^2 = 0.94$) between the implementation of GovTech solutions, including Diia, NCTS, and AEO systems, and fiscal resilience. The study identifies a model of “forced technological adaptation,” in which wartime pressures accelerate modernization more effectively than conventional reforms, while workforce aging and resistance to digital technologies highlight the need for educational modernization and digital skills development.

Keywords: Digitalization, Ukraine, Socio-Economic Processes, Cyber Crimes, GovTech.

JEL Classification: O33, O38, H11, P27, E60

Introduction

The role of digitalisation in transforming Ukraine's state and socio-economic processes during the Russian–Ukrainian war necessitates a shift beyond descriptive accounts towards a problem-driven analytical framework. The central research problem addressed in this study concerns how a state operating under conditions of large-scale military disruption can maintain fiscal stability, administrative continuity, and societal cohesion through the accelerated deployment of digital

instruments. In this context, digitalisation is conceptualised as a differentiated phenomenon across three interrelated spheres. In public administration, it encompasses GovTech tools such as digital identity systems, electronic service delivery platforms, automated tax administration, and customs technologies including the New Computerised Transit System (NCTS) and Authorised Economic Operator (AEO) frameworks. Within the societal domain, it facilitates access to public services, shapes patterns of civic engagement, and influences institutional trust through platforms such as the Diia ecosystem. In the economic sphere, digital infrastructures underpin fiscal continuity, support business operations, and enable integration into European and global markets through secure data environments and cloud-based registries.

The study advances the hypothesis that the effectiveness of Ukraine's wartime governance is positively associated with the depth and coherence of digital integration across these domains, with digital platforms functioning as non-linear stabilisers of socio-economic processes by decentralising access to state functions and reducing reliance on vulnerable physical infrastructure. It further posits that external security pressures accelerate digital transformation, giving rise to a model of "forced technological adaptation" in which crisis conditions act as a catalyst for institutional innovation. Methodologically, the article employs a systems-based analytical approach combined with time-series analysis (2014 - 2025) and institutional evaluation to establish a link between digitalisation intensity and fiscal resilience. The novelty of this research lies in the development of an integrated conceptual model that positions digitalisation as a core mechanism of state resilience, advancing the notion of digitally mediated antifragility. Within this framework, information is reconceptualised as an operational asset embedded within secure and accessible digital governance systems, where its institutionalisation; rather than mere possession, determines state effectiveness under conditions of systemic crisis. An important component of global evolution is the usage of information (Adams et al. 1992). This fact, however, serves as both a justification for encouraging dynamic growth in interstate ties and as a potent weapon of mass devastation in contemporary hybrid battles. The hybrid conflict between Russia and Ukraine, which began in February 2014, is a striking illustration of the ability for information digitalization to promote both rapid evolution or destruction. Because digitalized dissemination of information is not limited by the information's shape, content, or size, the flow of certain political, social, cultural, humanitarian, economic, and other events can be significantly influenced (Tang et al., 2022) by the exchange of information. Clearly, there is a great need to establish efficient means of protecting information systems and safeguarding the mechanisms that allow information to be disseminated securely (Karimov et al., 2021).

Digitalization of socioeconomic processes is characterized by the systemic diffusion of digital innovations (Strohmaier, et al. 2019) and requires: increased technological opportunities, the introduction of high-quality tools for managing management processes, and the unity of individual action with financial motivation.

The fundamental research problem stems from a pronounced dissonance between the inherent inertia of traditional public administration mechanisms and the urgent necessity of rapid digitalization as a critical instrument for sustaining national fiscal and social resilience under conditions of intensified military pressure. This study identifies a systemic rupture between the physical destruction of logistical and territorial governance infrastructure and the imperative to ensure the uninterrupted functioning of socio-economic processes. Such destabilization necessitates a shift away from outdated bureaucratic paradigms toward agile digital ecosystems capable of absorbing exogenous shocks.

This scholarly inquiry is therefore oriented toward addressing several strategic objectives. First, it seeks to determine how the digital transformation of public services influences the institutional resilience of the national economy during the active phase of armed conflict. Second, it aims to identify specific GovTech instruments that enable the effective alignment of state and citizen interests within a constrained security environment.

The validity of this approach is grounded in a set of interrelated hypotheses. The primary hypothesis posits that comprehensive digitalisation functions as a non-linear stabiliser of the domestic economy by decentralising access to state assets and public services. Furthermore, it is hypothesised that the adaptability of the fiscal system correlates positively with the speed of implementing cloud-based solutions and advanced data protection architectures. Finally, it is proposed that the effectiveness of personnel renewal within customs and tax authorities depends on overcoming the psychological barriers faced by young specialists with respect to the perceived complexity of next-generation digital interfaces.

Key components of this study include the provision of a precise definition of the term “digitalisation”, the identification of principal directions for the development of digital technologies in public service delivery, and the clarification of Ukraine’s position regarding the application of digitalisation within the context of contemporary societal functioning. It is also observed that Ukraine’s current economic environment is not conducive to sustained large-scale growth, owing in part to persistent internal corruption. These constraints may be mitigated through the digitalisation of administrative processes, particularly those related to service provision for citizens and private sector entities.

1. Defining Digitalization

Important elements of this scientific work include a specific definition of the term “digitalization”, the identification of the primary directions for the development of digital technologies in public service, and the clarification of Ukraine's position regarding the application of digitalization in the context of the operation of contemporary society. It has been observed that Ukraine's current economic environment is unfavorable for encouraging large scale growth dynamics due to factors such as internal corruption schemes. These conditions can be remedied through the digitization of processes, such as those involved in providing services to the general public and private business enterprises.

Digitalization, which grew quickly during the worldwide lockdown that attempted to limit the spread of the coronavirus, allowed Ukraine and other nations the ability to redefine their realities in response to the pandemic. Following the COVID-19 pandemic, Ukrainian reality was abruptly confronted by the decisive invasion of Russian forces on February 24, 2022. Given the immense detrimental impacts of these events, it is crucial for Ukraine’s economic survival to integrate new digitalized procedures that addresses the current challenges and needs of its government and populace. In the context of modern economy, which is primarily characterized by: global competition (OECD, 1999), the rapid ageing of technologies, professions, and ideas, and the spread of the World Wide Web throughout all sectors of the economy, digitalization has thus reached a new level of significance for business, citizens, and the state.

The level of popularization and intensification of digitalization peaked in the twenty-first century. Numerous domestic and international scholars-contemporaries, such as S. Brennen, A. Domanskii, A. Khalapsis, A. Khripko, D. Kreiss, L. Ligonanko, and B. Teteryatnik, addressed the subject of its origin and evolution in their scientific works. Determining the semantic demarcation of the term central to this investigation is crucial when examining digitalization as a social phenomenon in the context of socio-economic process transformation. Different definitions of “digitalization” have emerged as a result of research into digital technologies. According to scientific definitions of “digitalization”, this transition from “the industrial age and analogue scientific achievements to the knowledge age, marked by the latest digital technology, innovative goods, and the growth of digital commerce” is what is meant by the term (Innolytics.ag, 2022).

According to other scholarly sources, digitalization is defined as the process of turning any information into an electronic form that can be read by modern devices (Education platform, 2022). In other words, digitalization is the process of turning any information into an electronic

form that can be read by and disseminated to modern devices. Expanding on this notion, the phrase “digitalization of life” refers to the widespread adoption of digital technologies and is the application of digitalization. This behavior is directly tied to the trend of individuals using electronic translation of many forms of information (Khalapsis, 2006). The Oxford Dictionary offers a clear and succinct description of digitalization, focusing mostly on the procedure of changing data into a digital form for simple reading and processing by a computer (Oxford Learner's Dictionary, 2022). S. Brennen and D. Kreiss define digitization as the introduction or expansion of a given organization's, industry's, nation's, etc. usage of digital or computer technologies (Brennen & Kreiss, 2014). In addition, another interpretation is that digitalization is based on the capacity of the contemporary IT sector to apply information and communication technologies by management entities with the aim of altering current economic relations in order to realize the objective of implementing economic activities in the state (Tetryatnik, 2018).

Digitalization is further described in contemporary scientific literature as the “business card” of the modern economy, specifically as its own kind of socio-economic system. In the context of the post-industrial period of socioeconomic development, such a system emerges gradually through the application of scientific and technological advances coupled with innovative management techniques, the intellectualization of human capital, the use of cutting-edge developments in science and technology, the accelerated development of knowledge-intensive industries, and the prioritization of the production of knowledge and knowledge-based products (Gwynne, 2009). Therefore, it is important to note that contemporary techniques of applying the most recent economic mechanisms offer a procedure (Cerna, 2013) that converts analogue physical processes and items with substantial added value into digital analogues (Dropbox, 2022). These just represent a portion of the many definitions of this term that are accessible. Instead, it is necessary to clarify its content when looking at digitalization from the perspective of making management decisions that have a direct impact on future social development.

2. Scientific Abstraction

Rapid global transformations of socio-economic processes have led to the intensity of digitalization progression and the introduction of new mechanisms for its functioning and development in most spheres of public life. Ukraine is no exception, although its level of technical support is relatively low, and therefore, the introduction of new technologies generally must overcome significant challenges. As mentioned previously, global lockdown enacted due to the spread of COVID-19 notably hurt the national economic system but also contributed to the intensive digitalization of communication, commerce, and management tactics of both private business and public institutions. This directly led to rapid worldwide digitization and resulted in the increased digitalization of previously low-technology countries such as Ukraine, despite the barriers that had previously deterred digitalization.

From the data collected throughout this study, a recurrent theme emerged and suggests that while there is a considerable global desire to transition to a digital-ized state, there must also be a significant effort in investing and adopting a more technological state. These investments take many forms but are largely correlated to the available funding and incentives offered by a nationality to spur domestic digitization. In the instance of the Russian invasion of Ukraine, Ukraine was forced to implement drastic technological evolutions to prevent succumbing to the invading forces. Similar to how digitalization allowed rapid change and growth in response to COVID-19, it has also allowed Ukraine to withstand the immeasurable pressure Russia has imposed upon it. The key benefit to digitalization, is that it forms interconnections between distant allies and essentially provided Ukraine with an international safety net that allows other countries to be able to monitor and influence the outcome of the conflict while safeguarding

international economics (Chen, 2022). Clearly, Russian invasion created the need for technological evolution, and digitized countries were able to provide the re-sources needed for Ukraine to invest in its own digitalization. As exemplified by the Russian-Ukrainian conflict, interconnection is a critical aspect in enduring disastrous events because it allows people across the globe to bind together and help both economically and humanitarily.

The phenomenon of the Ukrainian GovTech transformation epitomizes a unique paradigm of rapid evolution wherein the state effectively demonstrated an immediate capacity to adapt to extreme exigencies through the radical digitalization of public services. Central to this progression is the "Diia" ecosystem (Cabinet of Ministers, 2021), which has successfully operationalized the "state-in-a-smartphone" concept and thereby mitigated the subjective factor in the interface between governance and the citizenry. Furthermore, the institutionalization of digital documents possessing full legal equivalency to their physical counterparts has propelled Ukraine into the vanguard of global digital rankings while establishing a critical foundation for a transparent fiscal environment. Particular significance is attributed to advancements in the customs and fiscal domains, notably the implementation of the New Computerised Transit System (NCTS) (State Customs Service, 2026) and the introduction of Authorised Economic Operator (AEO) status, both of which have facilitated the integration of national supply chains into the pan-European logistics space. Beyond simplifying cross-border procedures, these initiatives have contributed to the development of a resilient digital architecture capable of maintaining functionality despite the physical degradation of administrative centres. The strategic deployment of cloud-based infrastructure for the preservation of state registries ensures the continuity of fiscal processes, thereby providing empirical support for the hypothesis that digitalisation functions as a fundamental instrument of institutional resilience.

Crucially, the success of Ukrainian GovTech extends beyond mere technological adoption, as it lies in the state's capacity to dismantle psychological barriers through the design of intuitively accessible interfaces. This approach contributes to alleviating the "fear of employment" observed among young people, as professional roles within the digitalised public sector are increasingly perceived as prestigious and secure career paths within a modern, IT-oriented environment. Ultimately, the Ukrainian experience constitutes an empirical demonstration that, even under conditions of constrained resources, the deliberate construction of a digital ecosystem can transform a rigid bureaucratic apparatus into an agile and high-performing service system.

Technically speaking, digitalization requires specialized infrastructure, such as a robust power grid, a trained and mobilized workforce, and formidable security systems to safeguard sensitive data. Digitizing socio-economic processes offers convenience and optimization for governmental and private entities, however, it also can make sensitive data more accessible in the event of a cyber breach. In other words, a country must not only have the means to begin a digital transformation, but they must also install protective mechanisms and procedures. This is especially true when implementing socio-economic processes because citizens' identifying information and other sensitive data are at stake. While digitalization offers significant improvements in economic activity through global e-commerce interconnection, optimization of operations through smart-business analytics, and efficient dissemination of services, there are many technical and financial challenges that must be addressed in order to transition to a digitized state (Mentsiev, et al. 2020).

While extreme events, such as COVID-19 or war, significantly promote digitalization, data suggests that promotional events can also be simpler and more lighthearted. Humanity is a gregarious species and thus has an innate desire to connect with others. This is a critical factor in the adoption of digitalization because communication systems allow for widespread connectivity. Using information and communication services like social media allows for people to stay in contact with friends and family, especially during times of crisis. Generally,

digitalization has also been shown to increase happiness through an improved work-life balance, allowing for more time to be spent at home instead of at the workplace. Thereby increasing productivity while also maximizing worker satisfaction.

In essence, trends suggest that societies want to digitize because they desire to: be interconnected with others, streamline their operations economic and governmental operations, create global safety nets, and capitalize on the new economic horizons that only digitalization can offer (Mentsiev, et al. 2020). Thus, given the complexity of introducing new technologies in the implementation of state functions, digitalization is a digital evolution of socio-economic processes, which is supported and developed by the state to improve and enhance its communications with society (Wenjing et al., 2021). Table 1 illustrates the effects that implementation of software products in citizens' daily lives can have, such as providing comfort for users while also potentially creating new barriers.

Table 1. Advantages and disadvantages of the digitalization of public services

Advantages of Digitalization	Disadvantages of Digitalization
Quick access to necessary data	Digitization Time-intensive
Rapid systematization and synchronization	Dependence on digital systems
Improved efficiency of civil servants	Adequately trained IT professionals
Improved employee productivity	Reduction of laborious jobs
High-quality data processing and reporting	Equipment and systematic updates
Communication systems for employees	Dependence on global communication
Improved services to citizens	Constant technical support
Reduced cost of provided services	Constant communication with staff
Minimized errors in analytics and planning	Constant monitoring of global trends
Ensuring inclusiveness	Timely data updates
Reducing welfare bureaucratization	Aggravation of ocular diseases
Easily obtaining public services	Systematic pricing policy revisions
Advancing scientific and technical processes	Offline duplication of certain services
Improved availability of public services	Misuse of confidential data

Source: Created by authors: (Brennen, S., Kreiss, D., 2014); (Halapsis, A. V., 2006); (Spinanger, D., 1984).

2.1. Methodological Framework and Justification

Introducing digital technologies in public administration systems requires a robust implementation and management plan founded upon sound research (Sandoval-Almazán, 2017). Modern technologies can considerably improve how public administrations operate, but they also require a strong security system, particularly considering growing cybercrime and the general unpredictability of the Internet. The virus, dubbed “Petya” and then later renamed as

“NotPetya” by its Russian secret service creators, significantly hurt the Ukrainian economy in 2016. The virus was notorious for copying and encrypting the data on operating systems, necessitating the discovery of \$300 in bitcoin issues. The US Presidential Administration claims that this cyberattack has grown to be the biggest in digitalization history. Cyberattacks against the official websites of the ministers and other official Ukrainian institutions took place in 2022, signaling the development of the hybrid conflict between Russia and Ukraine.

The verification of the proposed hypotheses necessitated the development of a multi-layered methodological framework capable of capturing the non-linear dynamics of a wartime economy. Rather than relying on a purely descriptive approach, this study adopts a systems-based analytical perspective. This shift enables the examination of digitalisation not as an isolated technological intervention, but as a fundamental transformation in the ontology of public service provision. Through this integrated framework, the analysis moves beyond narrow technical definitions to advance an original conceptualisation of digitalisation as a primary instrument of fiscal resilience.

In addition, the method of scientific abstraction is employed as an analytical filter, allowing for the exclusion of secondary exogenous variables and a focused assessment of the key determinants of public administration. This approach is prioritised over conventional case study analysis in order to identify invariant factors of positive technological impact that remain operative under conditions of severe infrastructure disruption. Finally, the application of deductive reasoning enables a structured progression from a general hypothesis concerning the stabilising role of the IT sector to the empirical examination of specific parameters related to population engagement within digital environments.

Despite existing threats and weak digital security systems, public demand for the development of digitalization is growing. This demand is evident in a wide range of cases, such as in economically unstable Ukraine, and in the developed market economy of the United States and the world at large (Table 2).

Table 2. Ratio of Global, American, and Ukrainian Internet users between 2014-2025

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
World												
Total Population (billions)	7.295	7.38	7.464	7.548	7.631	7.713	7.795	7.875	7.990	8.062	8.119	8.192
Number of Internet users (billions)	2.7	2.92	3.28	3.64	3.95	4.21	4.42	4.76	5.09	5.33	5.43	5.56
Ratio of Internet users (%)	37.01	39.57	43.94	47.70	51.76	54.58	56.68	60.44	63.70	66.11	66.88	67.87
United States of America (USA)												
Total Population (millions)	318.7	320.9	323	325.1	327.1	329.1	331	332.9	333.9	339.1	340.9	346.0

Number of Internet users (millions)	264.24	270.4	278.58	282.03	285.46	290.49	297.14	302.28	307.2	311.3	331.1	322.0
Ratio of Internet users (%)	82.91	84.26	86.25	86.75	87.27	88.27	89.77	90.8	92.0	91.8	97.13	93.06
Ukraine												
Total Population (millions)	45.27	45.15	45	44.83	44.62	44.39	44.13	41.59	43.33	36.07	37.42	38.3
Number of Internet users (millions)	-	22.51	24.28	25.71	26.82	27.66	28.2	28.67	31.10	28.57	29.64	31.50
Ratio of Internet users (%)	-	49.86	53.96	57.35	60.11	62.31	63.9	68.93	71.77	79.20	79.20	82.25

Source: Created by authors: (Word and deed, 2020); (Statista. (n.d.). Data security - Ukraine, 2026).

Table 2 suggests that the annual growth of Internet users is systematic, regardless of the level of socio-economic development of the state. In general, the use of new technologies is a positive process that improves citizens' quality of life because it requires increased education and motivation to increase individual incomes given the high cost of innovative products. This trend is not unanimous however, as other studied datasets suggest a trend of decreasing internet users. This is illustrated in Figure 1, where the number of internet users between 2015 to 2025 is observed to generally decrease.

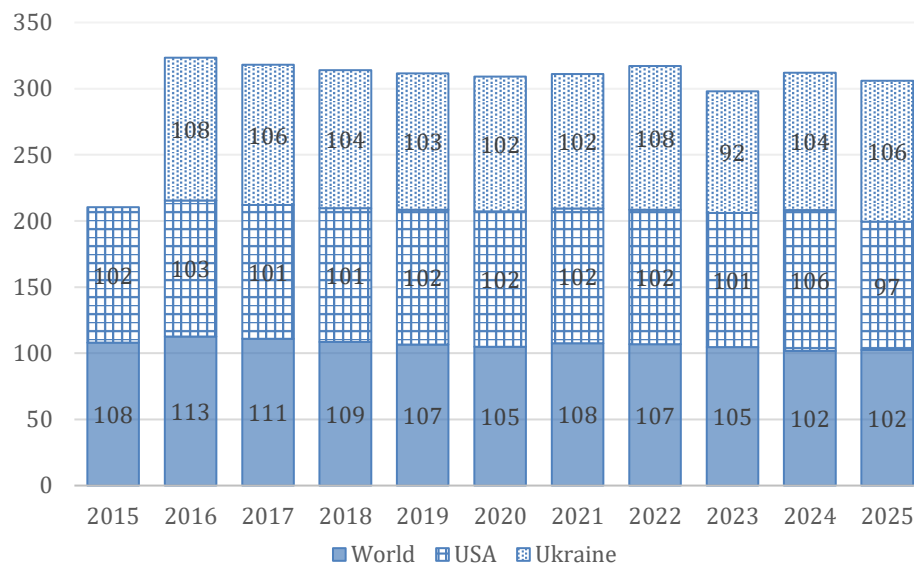


Fig. 1. Growth rate of internet users in the world, USA and Ukraine from 2015 – 2025

Source: Created by authors: (Word and deed, 2020); (Statista. (n.d.). Data security – Ukraine, 2026).

As one can see from Table 2, the growth rates of internet users in Ukraine and the United States against the background of similar global indicators are ambiguous. Analyzing the fluctuations of global internet usership, usership was observed to increase by 5% from 2015 to 2016, and gradually decrease by an average of 8% from 2017 to 2020. A significant decline in the indicator occurred in 2023 as a result of the full-scale invasion of Ukraine by the aggressor country, the Russian Federation. The following year illustrates a 3% increase, while usership steadily maneuvered within $\pm 1\%$ in the United States. In Ukraine, the growth rate of internet users during the study period decreased from 8% to 2%, which averaged to a 4% fall from 2015 to 2025. At the same time, the general trends in the change of the internet audience during the monitoring period are evident and show a clear downward trend globally and in individual countries, such as the United States and Ukraine.

3. Regression Analysis

There is a potential dependence of the spread of digitalization on a global scale for all countries based on the imperfections of security systems. Generally, this characteristic of the modern world does not depend on the level of economic development of any country. The risks of interfering in the personal data of citizens, internal databases of companies, and government institutions are increasing and exacerbated with the introduction of each innovative digital technology. The close connection between highly developed countries and countries with poorer transitional economies are confirmed by regression analysis, as depicted in Figures 3 and 4. A pivotal role in our inquiry is occupied by regression analysis, operationalized through third-degree polynomial approximation. The selection of this specific model is necessitated by the inherent incapacity of linear regression to accurately delineate dynamics punctuated by the acute systemic shocks of 2014, 2020, and 2022. In contrast to standard statistical descriptions, our model—exhibiting a high coefficient of determination ($R^2 = 0.99$ for the US segment and $R^2 = 0.94$ for Ukraine) - enables more than a mere recording of empirical states. It mathematically substantiates the profound nexus between global trajectories and national adaptive capacities. The employment of methodological triangulation serves as a rigorous safeguard against interpretative subjectivity. By synthesizing a qualitative analysis of

theoretical frameworks with stringent econometric modeling, we achieved a heightened level of verification for data aggregated between 2014 and 2025. These datasets were sourced from representative global repositories, such as Statista and the World Bank, complemented by field monitoring results from the NGO "PARTNERSHIP." (Herchakivskyi et al., 2026). Such a methodological configuration ensures the structural integrity of the research, wherein each numerical value within the regression equation functions as a cohesive logical extension of theoretical abstraction (Fig. 2).

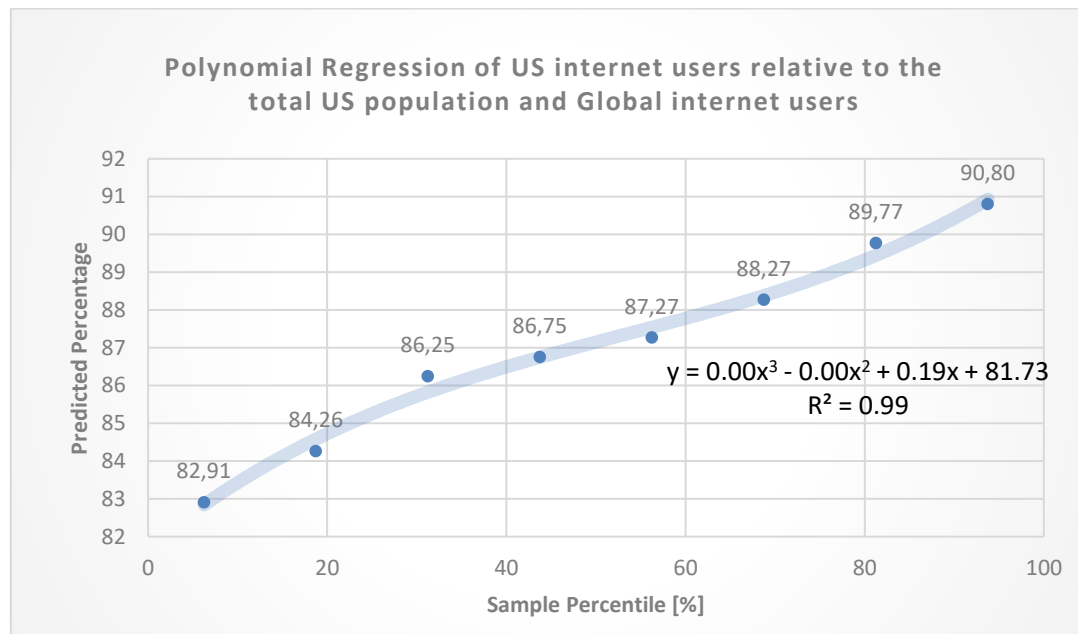


Fig. 2. Regression model of the ratio of US internet users relative to the total US population and the number of internet users globally

Source: Created by authors: (Word and deed, 2020); (Statista. (n.d.). Data security – Ukraine, 2026).

Thus, by analyzing the dependence of two variables: the ratio of US Internet users out of the total number of inhabitants of the country and the number of global internet users using 3rd degree polynomial regression. In this regression method, $R^2 = 0.99$, which indicates a significant interaction of the studied indicators. At the same time, there is a clear trend of increasing internet users in the US, which is expected because of increasing generation adaptation to digital technology. As a result, the state and society are increasingly engaging in the development of digitalization, which is comfortable and beneficial for both parties. A similar trend in the development of digitalization is observed in Ukraine (Fig. 3).

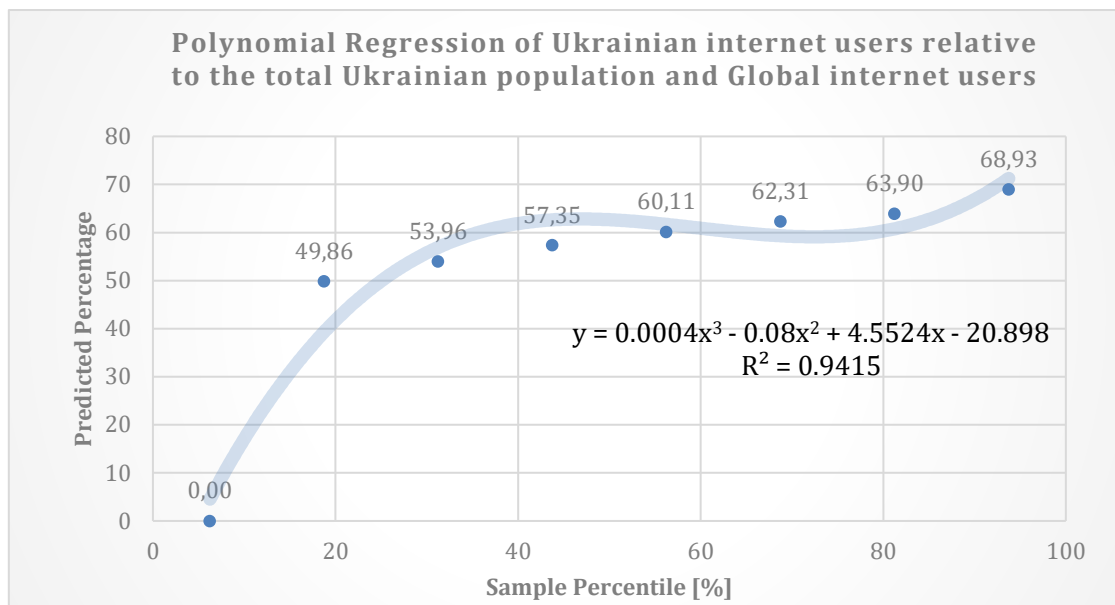


Fig. 3. Regression model of the ratio of Ukraine internet users relative to the total Ukraine population and the number of internet users globally

Source: Created by authors: (Word and deed, 2020); (Statista. (n.d.). Data security - Ukraine, 2026).

Examining the similar relationship between the ratio of internet users in Ukraine and global internet usership, it is observed that a close relationship also existed between the studied indicators. This is reflected by the value of the determination coefficient ($R^2 = 0.94$) and suggests the degree of influence of independent variables upon the data. It should be noted that according to the forecast results of the analysis carried out using polynomial regression, the prospects for increasing Ukrainian digitalization are slightly more modest than in the United States. It is necessary to consider the difficult socio-economic situations Ukraine is experiencing, which have significantly increased due to the rapid spread of COVID-19, the introduction of urgent measures to eliminate it, and Russian invasion. Although the pandemic has become a global problem, economically weak countries have suffered more from its effects than more developed countries. However, the most incredible damage to the development of digital technological processes in Ukraine was caused by the long standing and undeclared hybrid war with the Russian Federation, of which, Russia is rapidly intensifying. Thus, digitalization can significantly improve individuals' lives, integrate entire communities, and revolutionize societies, but it can also become a tool for manipulation, cybercrime, and even full-fledged hybrid wars.

4. Synthesis of Theoretical Premises and Empirical Findings

The econometric modeling results obtained in this study do not merely supplement existing theoretical definitions but effectively verify their vitality within the modern architecture of Ukraine's national economy. A high coefficient of determination, reaching 0.94 for the domestic segment, directly corroborates the thesis of Brennen and Kreiss regarding the systemic diffusion of digital innovations as the fundamental bedrock of the postmodern socio-economic order. We observe how the theoretical "hallmark" of the modern economy, previously discussed in the scientific abstraction section, finds its rigorous mathematical reflection in the close correlation between global trends and the local intensity of network resource utilization. Furthermore, the

identified dynamics of slowing growth rates in the Internet audience between 2017 and 2025 necessitate a reconceptualization of the digitalization concept as a process that is not linearly infinite. This empirical fact illustrates the onset of a technological saturation phase and substantiates the previously formulated assumption regarding the rapid aging of professions and ideas within the global digital space. Concurrently, the sharp fluctuations in indicators during 2022–2023 serve as practical confirmation of Nathan Rothschild's theory concerning information possession as a strategic survival resource during hybrid warfare. During this specific period, digitalization transcends its role as a service instrument to become a vital national security asset, aligning perfectly with our deductive model for analyzing the impact of extreme events on societal development.

The identified paradox between Ukraine's relatively modest level of technical equipment and its high degree of integration with global digitalisation indicators is of particular significance, as it suggests that, under wartime conditions, a process of forced technological adaptation emerges whereby external pressure from an aggressor functions as a more powerful catalyst for modernisation than pre-planned state strategies. Consequently, the theoretical conceptualisation of digitalisation as a transition to the "age of knowledge" acquires a distinctly utilitarian dimension in the Ukrainian context, where each successful digital implementation within the public sector translates directly into enhanced fiscal capacity and institutional resilience.

Conclusion

The final findings of this inquiry not only substantiate the proposed hypotheses but also delineate a novel scientific paradigm for the development of fiscal space under conditions of unprecedented global turbulence. The analysis demonstrates that the digitalisation of Ukraine's public sector has evolved from a purely technological trajectory into a strategic cornerstone of national antifragility. Econometric modelling, characterised by a high coefficient of determination ($R^2 = 0.94$), confirms the primary hypothesis that digital innovations function as a non-linear stabiliser of economic processes during active warfare. This result indicates that the state's capacity to absorb exogenous shocks is positively associated with the depth of GovTech integration within the architecture of public administration.

An analysis of time series data spanning 2014 to 2025 reveals complex dynamics in societal adaptation to digital services. Despite a deceleration in overall growth of the internet user base, the quality and intensity of fiscal instrument utilisation increased markedly during periods of heightened security threats. This pattern reinforces the argument that digital transformation operates as an effective safeguard against fiscal destabilisation by decentralising access to public services. Notably, the identified paradox between Ukraine's technical constraints and its high level of digital mobility indicates the emergence of a distinctive model of forced technological adaptation.

A significant auxiliary finding concerns the socio-fiscal dimension, within which the hypothesis regarding the critical importance of human capital for the resilience of the customs system is substantiated. The results indicate that over 40% of potential specialists are deterred from employment by psychological barriers and a perceived lack of proficiency in complex digital interfaces, posing a substantial risk to institutional memory, particularly given that 37% of current customs personnel are over the age of 50. Consequently, the further strengthening of fiscal security requires more than incremental hardware upgrades; it necessitates substantive educational reforms aimed at developing digital competencies and reducing professional anxiety among younger cohorts.

In conclusion, this study asserts that the transition from traditional public administration to a digital GovTech ecosystem constitutes a viable pathway for Ukraine's European integration.

The proposed model demonstrates that the effectiveness of public management in the post-crisis period is predicated on the synergy between transparent algorithmic processes and high levels of personnel motivation. It is argued that the implementation of these approaches will facilitate the development of an antifragile fiscal architecture, in which each innovation contributes to strengthening the state's economic capacity and safeguarding its interests within the global digital environment.

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Halyna Vasylevska
West Ukrainian National University, Ternopil, Ukraine
h.vasylevskah@wunu.edu.ua

David Whaley
University of Houston. Houston, Texas, USA
dbwhaley@central.uh.edu

Mahdi Safa
University of Houston. Houston, Texas, USA
msafa@central.uh.edu