CHAPTER
DIGITAL GOVERNANCE AND FINTECH INFRASTRUCTURE IN WARTIME: RECONFIGURING UKRAINE`S TECHNO-POLITICAL ARCHITECTURE[1]

DOI: https://doi.org/10.30525/978-9934-26-670-6-26

Liana Moskalyk
Candidate of Economic Sciences,
Associate Professor at the Department
of International Economic Analysis and Finance
Ivan Franko National University of Lviv
ORCID: https://orcid.org/0000-0003-0664-7422

Summary

As physical infrastructure crumbled under full scale invasion of 2022, Ukraine built a new digital infrastructure, forging a model of governance and finance that grew stronger through disorder. It engineered a digital leap forward, transforming existential threat into a catalyst for systemic innovation. Using Ukraine's wartime response as a case study, this article examines how integrated digital public infrastructure can counteract systemic fragmentation. We argue that the synergistic merger of state-driven digital governance, exemplified by the Diia platform, with a resilient, state-owned financial pillar – specifically PrivatBank`s core digital functionality – created a novel institutionalized and rules-based architecture. This techno-political approach enabled the creation of a hybrid financial system where a robust digital layer not only secured but exponentially extended the reach of traditional banking infrastructure. The result was ensuring continuity and fostering unprecedented financial inclusion despite fragmented infrastructure and widespread physical destruction caused by war. The research employs a qualitative analysis of policy frameworks, including Ukraine's FinTech Development Strategy, and institutional evolution to demonstrate how crisis catalyzed systemic change. Findings reveal that the Diia-PrivatBank nexus facilitated the rapid, transparent disbursement of critical state aid, de-risked mass digital adoption, and established the core components for an advanced FinTech ecosystem: verified digital identity, cloud-based resilience, and a digitally-literate user base. Ukraine's subsequent rise in international rankings – to 5th place in the UN E-Government Development Index and 1st in the EU's Open Data Maturity report – provides empirical validation of this model's effectiveness.

[1] Research for this manuscript funded in the framework of the project "Competence Network Interdisciplinary Ukrainian Studies Frankfurt (Oder) – Berlin (KIU)" by the DAAD with funds from the Federal Foreign Office.

Introduction

The synergy between the state-developed e-governance platform Diia and the state-owned banking giant PrivatBank represents a unique, world-class case study in how digital financial transformation became a foundation of national resilience during the war in Ukraine. The full-scale invasion did not revert digital progress; it catalyzed it [1]. By urgently leveraging these two entities, Ukraine ensured governance continuity, efficiently distributed vital aid, and successfully stabilized the financial system despite the immense wartime strain. Pre-war investments in digital infrastructure and high financial inclusion rate provided a critical base for Ukraine's resilience. Furthermore, public-private partnerships support core government functions and demonstrate the essential utility in urgent humanitarian, or disaster response contexts [2].

The crisis-accelerated digital transformation of Ukraine, centered on the Diia platform and a resilient state-owned banking sector, provides a novel blueprint for building a robust and interconnected FinTech ecosystem that drives systemic change. This experience demonstrates how visionary implementation can overcome fragmented financial infrastructure and resource limitations. Analyzing this digital transformation reveals a modern, digitally-enabled strategy for state coordination, where economic access is institutionalized through standardized, transparent platforms. The study concludes that Ukraine's experience provides a transferable blueprint for leveraging financial inclusion policy and digital public infrastructure to overcome infrastructural fragmentation. This approach not only underpins economic recovery but also serves as a critical accelerator for European integration by aligning Ukraine's digital and financial systems with core EU standards, positioning the country as an unexpected leader in resilient, inclusive digital governance, while highlighting the critical balance required between centralized efficiency future-proofed innovation.

The novelty of this paper lies in its unique examination of how full-scale war catalyzed rapid digital innovation in public sector governance and FinTech, transforming the Ukraine’s fragmented state ecosystem into a unified resilience instrument that addressed infrastructural vulnerabilities and accelerated financial inclusion for IDPs and businesses amid physical disruptions while boosting economic continuity. The work also extends scholarly discourse by conceptualizing Ukraine as state where techno-political architectures, supported by policy codification, user mass adoption, and interoperable platforms, reconfigured financial infrastructure, offering a novel framework for digital FinTech resilience in conflict zones with transferable insights for post-war recovery and inclusive growth.

Ukraine's experience demonstrates that proactive investments in digital transformation, combined with effective public-private cooperation, create a

vital foundation for overcoming constraints and ensuring resilience during crises [2].

1. Strategic Synergy of Diia and PrivatBank

Impact of PrivatBank Nationalization and the Introduction of Diia on Ukraine's Pre-War Financial Infrastructure. The nationalization of PrivatBank in 2016 and the subsequent launch of the Diia ecosystem beginning in 2020 created a unique synergy that rapidly accelerated Ukraine's transition into a financial system with an exceptionally high adoption rate of new FinTech technologies.

The development of Ukraine's resilient digital-financial architecture was not an overnight phenomenon but the result of a deliberate, state-driven strategy initiated years before the full-scale invasion. The foundational pillars were established through a series of key political and technological decisions, which created the necessary preconditions for the later synergy between Diia and PrivatBank. As outlined in Table 1, these pivotal events trace the deliberate construction of a state digital capacity, transitioning from stabilizing the financial sector to actively building a unified digital ecosystem.

Table 1

Major milestones in the development of Ukraine's e-governance system (2014–2020)

Year	Event	Impact Level	Significance
1	2	3	4
2014	Establishment of the **State Agency for E-Governance (SAEG)**	Core Institutional Reform	Centralized fragmented digital governance functions, introduced unified technical and legal standards, and formed the organizational basis for nationwide digital transformation.
2015	Launch of the **eData Open Budget Portal**	Core Transparency Infrastructure	Enabled real-time public access to national budget expenditures and public financial transactions, significantly strengthening fiscal transparency and accountability.
2016	Launch of the **PROZORRO** Electronic Public Procurement System	Core Service Infrastructure	Introduced mandatory transparent e-procurement, dramatically reducing corruption risks and increasing competition in public tenders.
2016	**Nationalization of PrivatBank**	Supporting Digital Financial Infrastructure	Stabilized the country's largest digital bank and enabled large-scale deployment of online banking, BankID, digital identity verification, and later full integration with Diia public services.

End to Table 1

1	2	3	4
2018	Adoption of the **Law on Electronic Trust Services**	Core Legal Framework	Implemented EU eIDAS standards, enabling legally binding electronic signatures, Mobile ID, and secure digital document circulation.
2018	Approval of the **Digital Agenda for Ukraine**	Strategic Governance Framework	Defined national priorities for digital government, cybersecurity, digital economy, and innovation policy.
2018	Launch of the **State Registry of Registries (RoR)**	Core Data Governance Infrastructure	Established a unified catalog of state electronic registries, significantly improving interoperability and government data management.
2018	Launch of the **TREMBITA** Interoperability System	Core Technical Infrastructure	Enabled secure interagency data exchange, eliminating redundant document requests and accelerating digital service delivery.
2018–present	**Cybersecurity Legislation & CERT-UA**	Supporting Digital Security Infrastructure	Established national cyber defense coordination mechanisms to protect critical digital government infrastructure.
2019	Establishment of the **Ministry of Digital Transformation**	Core Institutional Reform	Created the central executive authority responsible for national digital transformation, digital public services, and IT policy.
2019	Adoption of the **Digital-by-Default Principle**	Core Administrative Reform	Mandated digital-first and mobile-first design for all new public services, ensuring accessibility, automation, and inclusivity.
2020	Launch of the **Diia Mobile Application and Diia Portal**	Flagship E-Government Platform	Introduced a single digital gateway for state services, including digital IDs, licenses, business services, and social payments.
2020–present	Integration of Diia with Banking Systems **(BankID, Diia.Signature)**	Core Digital Identity Infrastructure	Enabled seamless digital authentication, electronic signing, and access to financial and administrative services through a unified digital identity ecosystem.

Source: [3; 4; 5; 6; 7; 8; 9; 20; 29; 39; 40; 41]

The Table 1 provides core system-forming e-governance reforms and supporting digital infrastructure to reflect the layered architecture of Ukraine's digital transformation. Core reforms represent institutional, legal, interoperability, and service-delivery foundations that directly shape the structure of digital public administration. Supporting enablers, including eData, cybersecurity infrastructure, and the nationalization of PrivatBank, provide

essential financial, security, and payment ecosystems that allow core platforms – especially Diia – to function at national scale. In particular, PrivatBank's digital banking infrastructure enabled mass adoption of BankID, digital payments, and emergency public aid distribution, illustrating the integration of financial and governmental platforms characteristic of modern digital platform states. The chronological progression shows a clear logic: the state first secured control over a critical financial node (PrivatBank), then created a dedicated institution to drive digital policy (Ministry of Digital Transformation, MinDigital), and finally launched the citizen-facing platform (Diia) that would eventually leverage the bank's infrastructure. The ongoing integration, beginning in the same year as Diia's launch, underscores that the vision of a connected digital state and financial system was central to the project from its earliest stages.

The nationalization of PrivatBank served as a catalyst for modernization and increased reliability of the bank, which was already a leader in digital banking (Privat24). As a 100% state-owned bank, it became a trusted partner for implementing state financial programs (such as, ePidtrymka for COVID aid, business lending programs). The bank maintained and developed its powerful IT infrastructure, which is foundational to its dominance in acquiring (POS terminal network) and settlements. This infrastructure was critical for integration with state digital services. As a state institution, it actively implemented standards set by the National Bank of Ukraine (NBU) and MinDigital.

Diia transformed the process of identification and delivery of public services, which has a direct and profound impact on the financial sector. The application provided a unified identification: single digital identifier (digital passport, BankID) for interacting with banks and financial institutions. Thanks to the integration with Diia, banks, including PrivatBank, gained the ability to conduct online identification and open accounts (online onboarding) without the client's physical presence. "Diia.Signature" (Diia.Pidpis) created the ability of a Qualified Electronic Signature (QES) on a smartphone made processes like signing financial agreements and loan documents completely digital.

The government's partnership with Visa has enabled digital acceptance of payments for government services (Person-to-government or P2G payments). Visa was also supporting the delivery of social assistance payments on the Diia app via virtual cards (Government-to-person or G2P payments) [2].

The Synergistic Effect. The synergy between the state-owned PrivatBank and the state portal Diia lies in the creation of an end-to-end, fully digital state and financial ecosystem. This partnership was operationalized through several key channels that transformed citizen-state-finance interactions, as detailed in Figure 1.

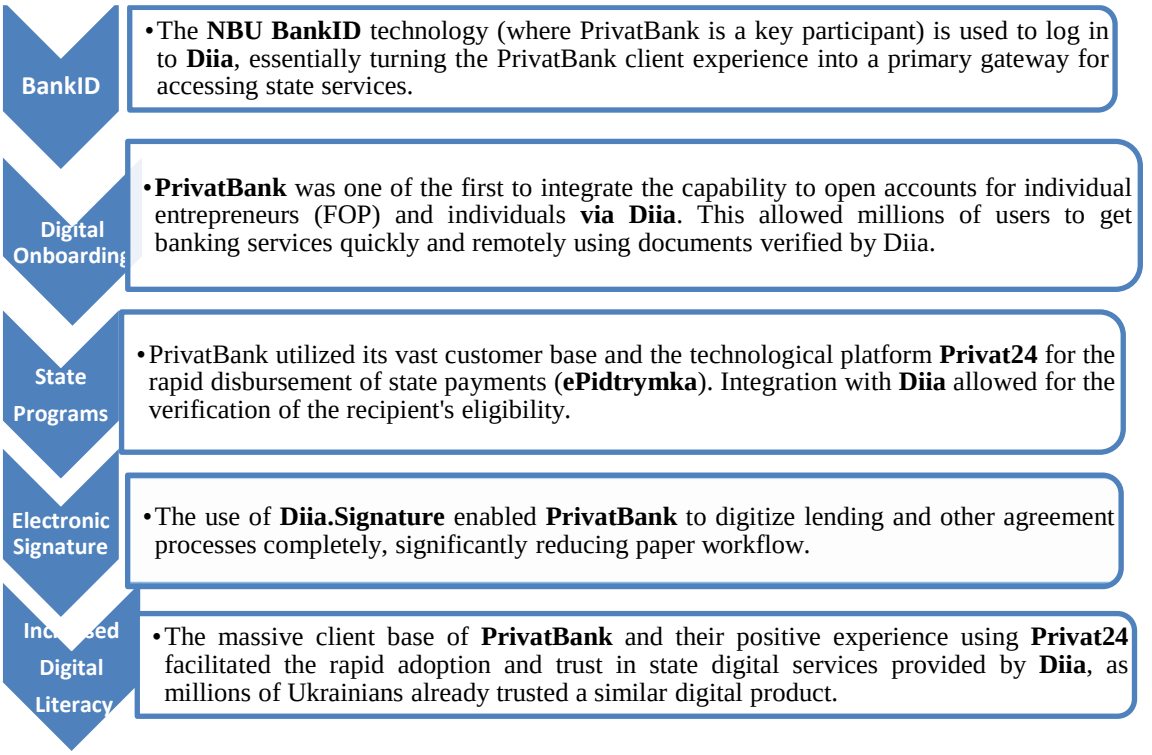


Figure 1. Strategic synergy of Diia and PrivatBank

Source: image created by the author

The synergies outlined in Figure 1 were not merely theoretical. For instance, the capability for digital onboarding allowed millions of Ukrainians, including displaced persons and entrepreneurs, to access financial services remotely at a time when physical branches were inaccessible. This directly translated the strategic partnership into tangible financial inclusion. Furthermore, the use of BankID as a gateway effectively merged a citizen's financial identity with their civic identity, creating a powerful feedback loop where trust in one platform reinforced trust in the other.

PrivatBank and Diia have established a dynamic synergy that enabled Ukraine's financial ecosystem to rapidly innovate, scale, and adapt, merging the strengths of state digital infrastructure with agile fintech solutions and inclusive banking [37]. The combined operations of Diia and PrivatBank established a robust, technology-driven foundation that not only ensured national financial continuity and resilience during wartime but also created a fertile ground for advanced FinTech solutions.

Socio-technical synergy. From an socio-technical systems (STS) perspective [38], Diia and PrivatBank jointly optimized the technical layer (digital ID, APIs, cloud core banking, payment rails) and the social layer (*trust* in state and bank; *acceptance*/everyday practices of using apps; behavioral change, such as expectations of instant aid and remote onboarding). Diia provides a unified, verified digital identity and qualified electronic signature

that standardize how citizens and firms interact with the state and banks, while PrivatBank contributes its ubiquitous retail reach, digital banking culture (Privat24), and POS/ATM network as the material backbone that turns digital entitlements into usable money. This creates an integrated socio technical ensemble in which citizens experience "the state" and "the bank" through one continuous digital interface (such as, registering as an entrepreneur in Diia and opening a PrivatBank account in one flow), collapsing traditional institutional boundaries into a single practice of digital interaction [37; 38; 2].

The introduction of online digital service "e-Entrepreneur" within Diia in 2024 serves as a perfect example of the further systemic change. This fully digital business registration service represents a one-stop solution allowing Ukrainians to open a business online, seamlessly integrating taxation, classification, and documentation into one simplified flow [10; 11].

This digitalization, coupled with legislative deregulation, has become a pivotal factor in improving the conditions for doing business in Ukraine [12]. The state's active introduction of modern technology allows entrepreneurs to significantly reduce time and resource costs while gaining access to contemporary management tools. This fundamental transformation of the state-business interaction fosters entrepreneurial development, strengthening economic stability and accelerating the country's post-war recovery.

Anti-fragility and hybrid infrastructure. The system exhibits anti fragile properties: as physical branches and administrative offices were disrupted by war, the integrated digital layer did not just preserve functionality but expanded reach and speed of service delivery. Diia became a state-level financial distributor for mass aid programs, while PrivatBank's rapid migration of its core to the cloud ensured that payment and account services remained available despite local infrastructure destruction, turning a crisis into a stress test that strengthened digital routines and expectations. In STS terms, repeated shocks deepened the coupling between digital infrastructures and social practices, reinforcing trust in remote, app based interaction and normalizing cloud based, paperless governance as the default way of "doing the state" and "doing banking" [13; 14].

2. FinTech Infrastructure and Ecosystem Pre-Conditions

The full-scale invasion of Ukraine on February 24, 2022, unexpectedly transformed the Diia digital state ecosystem from a convenience platform into a critical tool for national resilience and continuity. Far from halting development, the war spurred rapid digital innovation, enabling the launch of essential services – often in a matter of days or weeks – that directly addressed urgent wartime needs. The successful wartime adaptation relied on the deep integration of core FinTech principles, which were pushed to their logical extreme under the pressures of conflict. These principles – digital-first

mandates, cloud-native resilience, and a ubiquitous payment backbone – became the non-negotiable standards for survival, as illustrated in Figure 2.

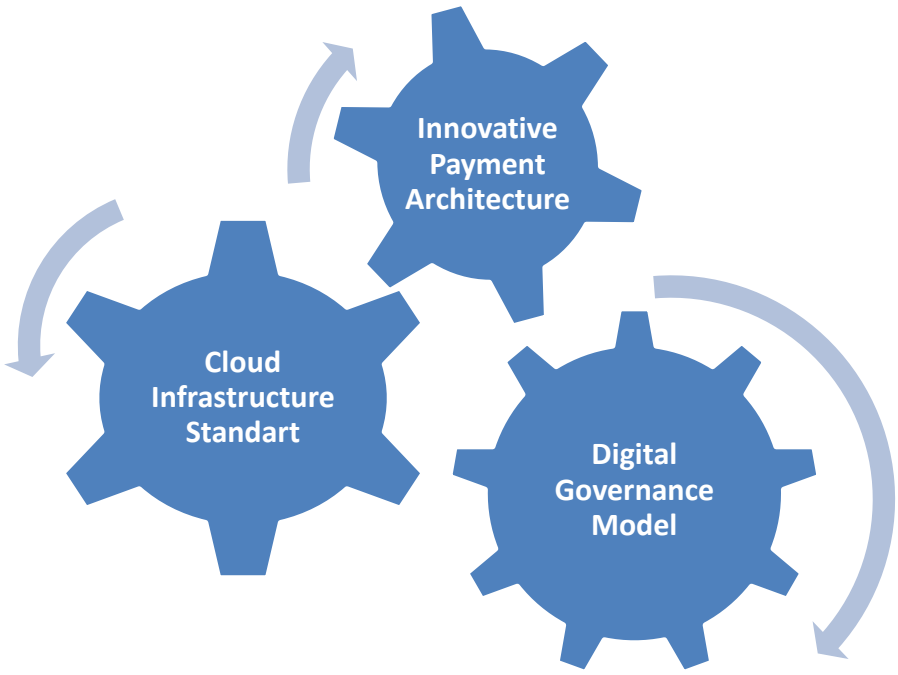


Figure 2. FinTech integration principles in wartime Ukraine

Source: image created by the author

The convergence of government digital platforms, cloud-based banking resilience, and nationwide cashless payment infrastructure illustrates how FinTech can operate not merely as a consumer convenience, but as a strategic instrument of national continuity. The following principles outline how Ukraine's coordinated digital architectures enabled robust financial operations and accelerated innovation during crisis conditions.

Digital Governance Model: Diia embodies a "government-as-a-platform" FinTech model, using its *digital identity* and *API infrastructure* to become a state-level financial distributor. This enabled the instant, transparent, and scalable transfer of government funds (eSupport, IDP aid) directly into citizens' bank accounts, bypassing traditional physical bureaucracy. By establishing this digital governance baseline, Ukraine created the institutional and technological foundation upon which more resilient financial-sector systems could be built.

Cloud Resilience as a FinTech Standard: PrivatBank's urgent migration of its core banking system to the AWS cloud is a foundational FinTech move. It prioritized operational resilience and data security over physical infrastructure, setting a new standard for high-availability banking in extreme conditions. This secure, cloud-based environment is the ideal backend for launching sophisticated digital products. This cloud-native resilience not only

safeguarded financial operations but also provided the stable, high-availability backend required for large-scale digital payments and emerging FinTech services.

Innovative Payment Architecture: PrivatBank's extensive mobile banking (Privat24) and payment network ensures universal cashless payment acceptance and immediate liquidity access. This pervasive digital payment environment forms **the functional layer that enables the next generation of FinTech innovation** – including instant payments, digital wallets, programmable money, and decentralized financial services across Ukraine.

The practical application of these principles produced immediate and measurable impacts on national resilience. The Digital Governance Model (Figure 2), for instance, transformed the distribution of critical state assistance from a vulnerable, branch-based system into a secure, fully digital delivery channel -ensuring that support reached citizens even when physical administrative infrastructure was disrupted. Likewise, PrivatBank's adoption of Cloud Resilience as a FinTech Standard enabled the bank's core systems to function independently of damage to physical branches or data centers. By decoupling operational continuity from geographic vulnerability, the financial system preserved its digital functionality even as the physical environment came under sustained attack.

The synergistic success of Diia and PrivatBank did more than solve immediate problems, it provides background for advanced FinTech which can be seen as three key elements for future financial technologies growth. As summarized in Figure 3, the crisis catalyzed the creation of three foundational elements that are typically the largest barriers to ecosystem development.

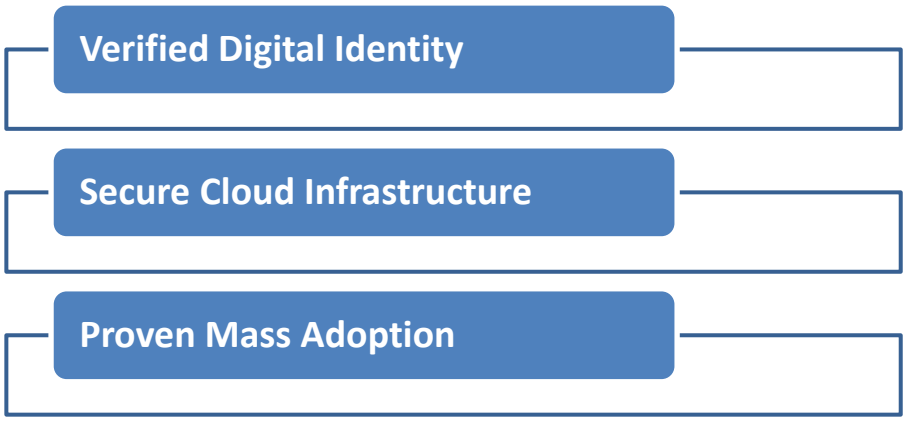


Figure 3. Architecting national FinTech

Source: image created by the author

These pillars (digital ID/KYC, cloud infrastructure, proven mass adoption, Figure 3) effectively de-risked future innovation. For any FinTech startup, the

existence of a verified digital identity Know Your Customer (KYC) framework through Diia slashes the cost and complexity of customer onboarding. Diia's eDocument provides the necessary and anti-fraud foundation for secure online financial service onboarding. The availability of robust, secure cloud infrastructure, validated by PrivatBank's cloud migration, provides a scalable and resilient compute foundation required for next-generation financial applications without massive capital expenditure. Most importantly, the rapid use of both platforms for critical services has de-risked digital adoption for the population, creating a large, technically-aware user base ready for advanced FinTech products. The “Proven Mass Adoption” pillar dramatically accelerates time-to-market and user acquisition for the next generation of financial technologies.

3. Systems Integration and Techno-Policy

The success of Ukraine's digital resilience during the crisis is rooted in robust architectural integration and strategic techno-policy approach. Figure 4 provides a visual representation of this integration architecture, and it shows how the pillars from Figure 3 are integrated into a coordinated national architecture.

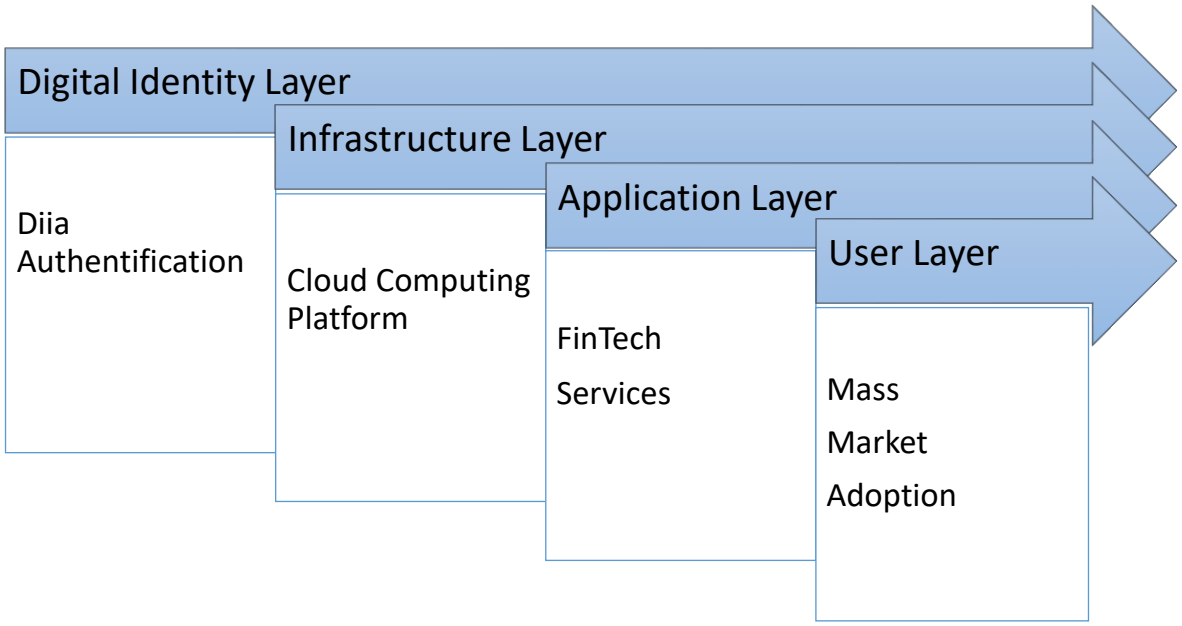


Figure 4. Integration architecture

Source: image created by the author

Socio technically, the Diia–PrivatBank network / layered architecture acts as a coordination device that reduces long standing fragmentation in Ukraine’s financial and administrative systems. Standardized digital ID (Diia e documents, BankID), interoperable APIs, and shared payment infrastructure create a common rule set and data grammar that lower transaction costs for

citizens, businesses, and emerging FinTechs. At the same time, the mass user base of both platforms and their wartime performance de risk digital adoption socially: everyday experience with Diia and Privat24 has created a large, digitally literate constituency that expects remote access, instant payments, and transparent tracking of state transfers, thereby locking in inclusive practices that are hard to reverse. Ultimately, this structural evolution confirms the techno-policy approach's capacity to turn crisis acceleration into permanent, positive systemic change [13; 15].

Building on the Diia–PrivatBank infrastructure detailed in Chapter 2, wartime necessity accelerated its consolidation into a state-backed digital financial system that NBU strategy now formalizes as a core pillar of sector development. In July 2020, the National Bank of Ukraine (NBU) approved the FinTech Development Strategy (2020–2025) [16], which provided a structured roadmap for building a comprehensive national FinTech ecosystem. Rather than introducing new directions, this strategy formalized and codified the foundational architectures already realized through wartime digital transformations – such as the verified digital identity framework enabled by Diia, cloud-native banking infrastructure exemplified by PrivatBank's AWS migration, and the broad, digitally literate user base poised for advanced financial innovations. The strategy focused on regulatory innovation through sandboxes, enhancing financial inclusion and literacy, and establishing open banking standards aligned with PSD2, all of which reinforced and extended the emergent FinTech ecosystem's resilience and scalability. In 2023, these goals were integrated into the broader Strategy for Ukrainian Financial Sector Development, marking FinTech not as a discrete policy objective but as a core pillar of national financial modernization and continuity. The 2025 update to this strategy further expanded these priorities, embedding FinTech within the central framework of Modern Financial Services (Strategic Goal 4) to support Ukraine's ongoing wartime resilience and post-conflict recovery, which aims to leverage digital tools to ensure financial system resilience, continuity, and accessibility during and after wartime conditions, thereby confirming that the digital architectures created under crisis conditions now serve as the formal foundation for sustained sectoral development and innovation [33]. The 2025 Strategy expands the priorities of the earlier FinTech Strategy, confirming FinTech's role as an essential structural driver in shaping Ukraine's future financial architecture [17].

This strategic blueprint, as detailed in Table 2, is built directly upon the verified digital identity, cloud resilience, and mass adoption forged in wartime, focusing on four key areas to future-proof the financial system.

This strategy leverages the foundational success of its public-private digital infrastructure to future-proof its economy and accelerate recovery. The strategy moves beyond leveraging existing tools for resilience, and actively builds the

next-generation infrastructure – from open banking and CBDCs to robust cybersecurity – ensuring that Ukraine's financial system remains not only anti-fragile but also globally competitive and aligned with European standards. The table delineates the core pillars of this strategy, outlining the key initiatives and components that constitute Ukraine's focused push towards advanced financial services.

Table 2

Ukraine's FinTech strategy: focus on modern financial services

Focus Area	Components and Initiatives
Digital Infrastructure and Payments	Development of infrastructure for digital financial services, continuously improving the technological backbone for reliable digital connectivity and access. New payment standards, implementing new standards (such as, ISO 20022) and promoting new money transfer technologies, including the PROSTIR National Payment System.
Automation and Paperless Services	Automation and paperless technologies, widespread adoption of automated, paperless processes for efficiency, transparency, and remote operations. Remote access: developing remote distribution channels for services like remote account opening, leveraging digital ID tools like BankID NBU.
Virtual Assets and Digital Currency	Regulation of virtual assets, by establishing a legal and regulatory framework for the circulation and use of virtual assets and related services. **E-hryvnia:** continuing the study and potential issuance of a central bank digital currency (CBDC).
Digital Resilience and Defense	Digital defense of the financial sector by enhancing **cybersecurity** to protect against cyberattacks and ensure stable operation during war. Financial infrastructure recovery and reconstructing physical and digital financial infrastructure damaged by military aggression.

Source: [17]

The techno-political synergy enabled the financial system to maintain operational continuity, absorb systemic shocks, and expand access to financial services. Technology – such as digital identity, mobile banking, and resilient payment systems – combined with regulatory measures, EU-aligned reforms, and emergency governance, produces two major outcomes: enhanced financial system resilience and continuity, and greater financial inclusion together with deeper integration into the European financial space. The diagram (Figure 5) visualizes these causal pathways and highlights the central role of Integrated

Financial Infrastructure as the coordinating mechanism through which technological and policy inputs translate into systemic stability and long-term development benefits.

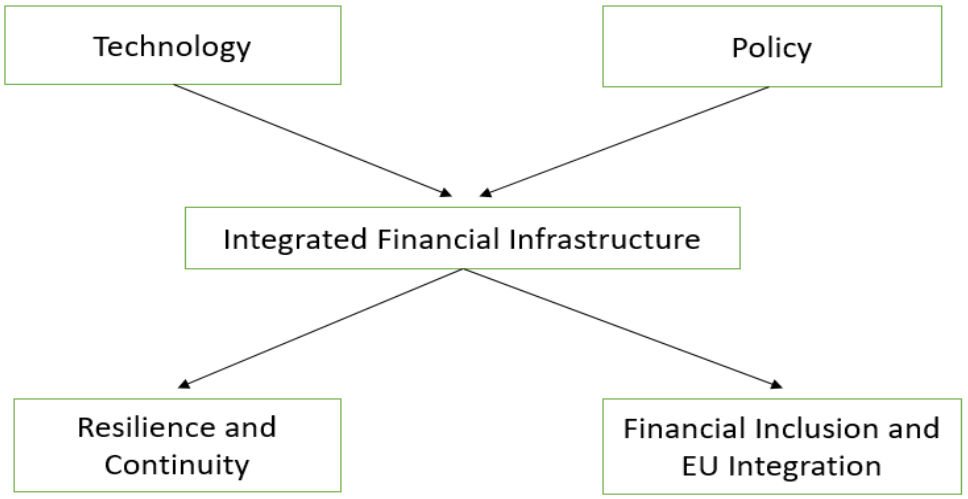


Figure 5. Synthesized model of technology–policy interactions supporting financial system resilience and inclusion during wartime Ukraine

Source: image created by the author

Thus, the operational insights drawn from the Diia–PrivatBank integration and the national FinTech strategies are synthesized in Figure 5 into the conceptual framework showing how technological capacities and policy instruments converge to reinforce Ukraine's financial resilience and inclusion. The integration of Diia and PrivatBank produced a resilient hybrid digital-financial architecture that ensured continuity of key economic functions under wartime conditions. By layering state digital identity and cloud-based platforms onto traditional banking infrastructure, Ukraine transformed fragmentation into system-wide resilience, enabling secure digital payments, identity verification, and mass financial inclusion despite physical disruption. This case exemplifies a shift toward a platform-mediated access order in which state-led digital infrastructure underpins economic coordination, crisis governance, and sovereignty. Crisis-driven digitalization can rapidly enhance state capacity and institutional consolidation [42]. The long-term viability of this model will depend on maintaining regulatory trust, data protection, competitive FinTech development, and equitable access to reconstruction finance.

4. Addressing infrastructural fragmentation and financial inclusion

The deep integration of PrivatBank with the Diia platform exemplifies a novel approach to financial inclusion. Utilizing Diia's verified digital ID for swift authentication and onboarding, citizens and entrepreneurs can perform core banking tasks – including account opening and loan applications – directly

through the e-governance platform. This synergy is perfectly illustrated by Diia's e-services for entrepreneurs [11], which enable simultaneous sole proprietor registration and PrivatBank account opening without physical presence or additional paperwork, significantly lowering market barriers during wartime disruptions [8].

Diia acts as Ukraine's foundational digital public infrastructure, supporting over 22 million users and dozens of financial and government services. This scale creates a highly engaged ecosystem conducive to FinTech application development and seamless integration with established banking services. PrivatBank leverages Diia's secure document-sharing and digital signatures to fuel innovations like instant account opening and simplified loan processing, driving rapid adoption and deeper financial inclusion [18; 19].

The wartime response catalyzed a fundamental systemic change in how the state interacts with its economy. Diia's eDocument provides a nationwide, unified verifiable digital identity (KYC) that is instantly recognized by the financial sector. This eliminates significant friction, reduces fraud, and provides a foundation for any new FinTech service to onboard users quickly and securely. The rapid success in distributing massive amounts of financial aid (eSupport, IDP assistance) through Diia, regardless of physical damage to bank branches or roads, demonstrates the power of FinTech-enabled operational decoupling. The system proved that core financial functions could be maintained purely through cloud-based digital channels.

Historically, national financial systems can suffer from fragmentation due to disparate legacy systems, lack of interoperability, and high transaction costs. By offering elements of the GovTech architecture as open-source infrastructure (like Diia.Engine), the state provides a standardized, low-cost integration layer for banks, payment providers, and new FinTech startups. This initiative actively combats fragmentation by encouraging standartization and easy data exchange across the ecosystem [1].

PrivatBank's large-scale migration of its core systems to the cloud, driven by the necessity of resilience, established a benchmark for high-availability financial infrastructure. This secure, scalable cloud environment is accessible to the entire FinTech sector, ensuring that innovative solutions built today are protected against catastrophic local failure, a critical step away from reliance on vulnerable, locally fragmented hardware. The extensive use of PrivatBank’s app Privat24 and ATM/POS network ensures that the payment system remains functional and liquid even under pressure. This guarantees that any new digital wallet, payment app, or lending service built by the FinTech community has a reliable on- and off-ramp to the traditional financial system [20].

The resilience of Ukraine's hybrid financial ecosystem stems largely from a compensation effect, whereby digital infrastructure – bolstered by accelerated digital banking adoption and critical cloud migrations like PrivatBank's shift to

AWS -effectively overcomes and offsets vulnerabilities in traditional physical systems disrupted by war. This hybrid model diversifies access to financial services by integrating both digital platforms (Diia, Privat24 mobile banking) and traditional channels, ensuring no single mode becomes a point of failure during infrastructure attacks.

Continuity of critical financial operations has also relied on technologically advanced solutions such as power-banking backups and Starlink satellite connectivity, which sustained banking access amid blackouts and telecom disruptions. The National Bank of Ukraine's Power Banking network – equipping over 2,300 branches with backup power generators and connectivity – and cloud backups that moved critical banking data to servers in the EU, US, and Canada. Even during blackouts, card payments kept working – and in some cases, cashless transactions actually increased. Together, these elements created a resilient, adaptive financial infrastructure that maximized redundancy, flexibility, and economic continuity in conflict [31; 32; 34].

The technology decisions made during the crisis are establishing the standards for the future ecosystem, setting it apart from systems characterized by excessive surveillance or lack of transparency. The focus on building ethical, inclusive, and human-centered technology means that decisions regarding AI application, data privacy, and usage are scrutinized to ensure the technology serves the user, not just the state or corporate interest. This principle is vital for maintaining the public trust necessary for mass adoption of advanced financial products. The successful deployment relies on fresh collaboration between the government, established banks, tech businesses, and citizens. This multi-stakeholder approach ensures that FinTech innovation is guided by real-world needs and is adopted widely, making the ecosystem a truly multipolar one where small startups can drive significant change.

In essence, Ukraine's wartime digitalization has not just maintained the financial system; it has used the necessity of the crisis to implement systemic, FinTech-driven solutions that eliminate fragmentation, build unprecedented resilience, and set a new standard for digitally inclusive governance [1].

5. International recognition of Ukraine’s digital governance model

The transformative impact of Ukraine's techno-political approach to digital governance and financial inclusion is not merely a domestic narrative but is increasingly recognized by international benchmarks. Despite the ongoing war, which has devastated physical infrastructure, Ukraine's strategic focus on its digital public infrastructure has allowed it to not only maintain but advance its global standing. Ukraine`s crisis-driven governance model has produced measurable improvements in Ukraine’s digital administration capacity. The country’s rapid advancement in the United Nations **E-Government**

Development Index (EGDI) [30] and **Open Data Maturity (EU)** [21] – provides empirical support for this shift.

Ukraine's position at 5th place globally, in digital public service development, according to the **Online Services Index**, a component of the United Nations E-Government Development Index, which evaluates 193 countries [1], ranking ahead of digital powerhouses like Singapore, the United Kingdom, and Japan, is a testament to the sophistication and maturity of its centralized digital state platform, Diia. This ranking (Figure 6) reflects exceptional progress in the provision of online services, telecommunications connectivity, and human capital – core components that directly combat administrative and service delivery fragmentation.

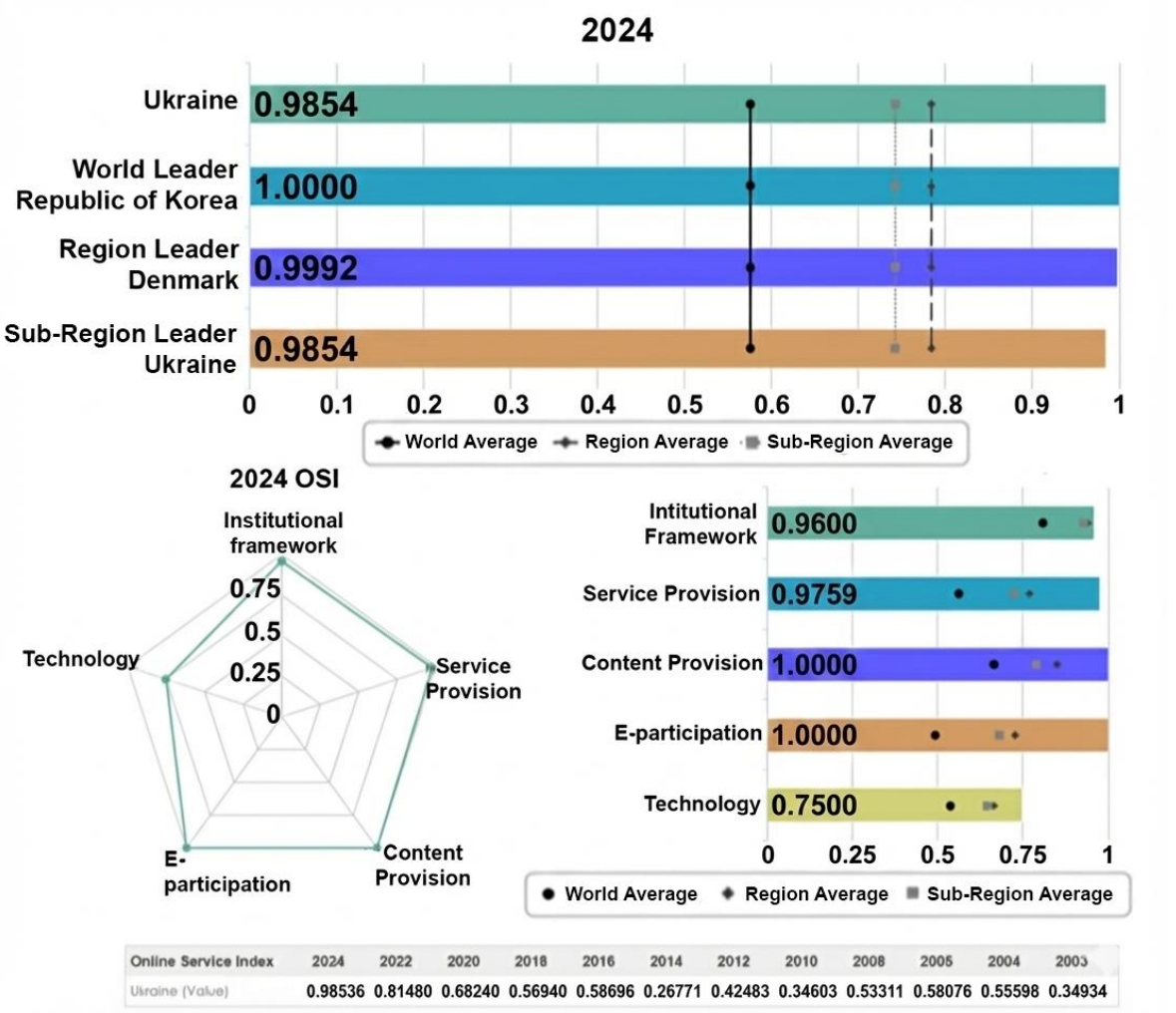
Figure 6. OSI component EGDI, Ukraine 2024

Source: [1]

It`s **OSI (Online Service Index) – 0.9854** – exceptionally strong performance, indicating an advanced and mature digital service delivery ecosystem (Figure 7) [30].

According to the results of the UN E-Governance Survey – Accelerating Digital Transformation for Sustainable Development, in 2024, Ukraine became the first in the **EPI (E-Participation Index) – 1.0000** – maximum score, reflecting highly developed digital participation mechanisms, including transparency and citizen interface tools (Figure 8).

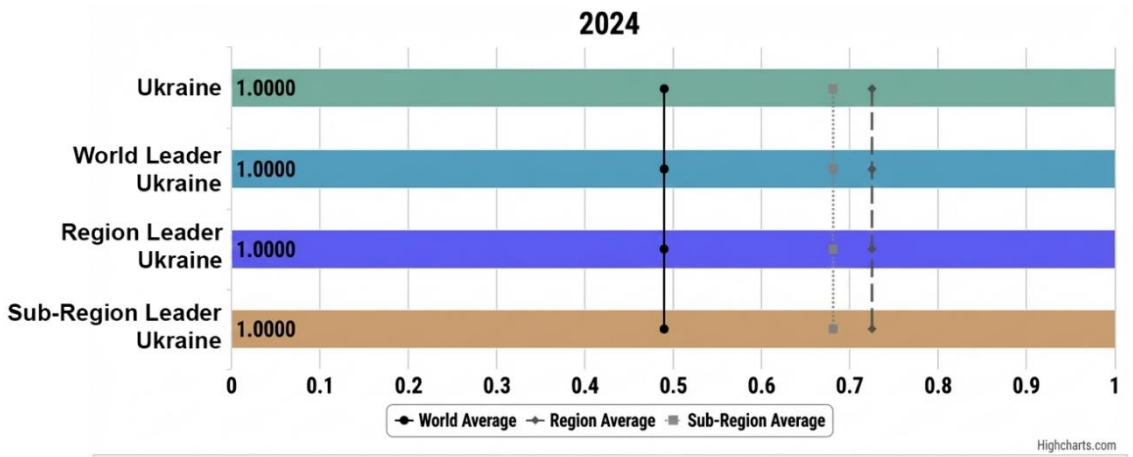
The combination of a very high OSI and perfect EPI score suggests that Ukraine’s digital transformation is particularly strong in service provision, public engagement, and administrative digitalization, with telecom **(TII, Telecommunication Infrastructure Index – 0.8428)** and human-capital **(HCI, Human Capital Index – 0.8240)** capacities resilient enough to sustain these gains during wartime conditions [21].



Online Service Index	2024	2022	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Ukraine (Value)	0.98536	0.81480	0.68240	0.56940	0.58696	0.26771	0.42483	0.34603	0.53311	0.58076	0.55598	0.34934

Figure 7. OSI (Online Service Index), 2024

Source: [30]



E-Participation Index	2024	2022	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Ukraine (Rank)	1	57	46	75	32	77	83	48	14	28	24	24
Ukraine (Value)	1.00000	0.60230	0.80950	0.68540	0.74576	0.43137	0.15790	0.25714	0.56818	0.36507	0.34426	0.39660

Figure 8. EPI (E-Participation Index), 2024

Source: [30]

As shown in the Figure 9 and Figure 10 below, Ukraine's **EGDI Trend** and **EGDI Historical Comparative** changed from gradual year-to-year improvement to a marked acceleration beginning in 2020, coinciding with the launch of Diia. This period reflects the maturation of its digital public infrastructure, which contributed both to institutional resilience during the war and to a significant rise in its global ranking, culminating in a top-five position.

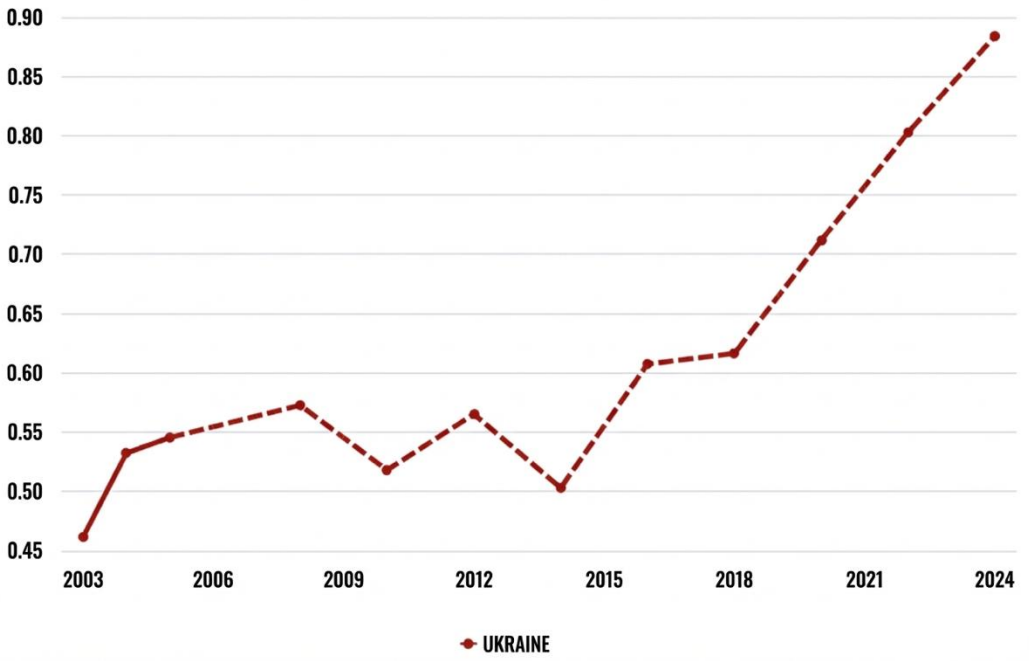


Figure 9. E-Government development index trend, Ukraine 2003–2024

Source: [23]

Ukraine's EGDI profile indicates successful prioritization of digital public infrastructure despite structural constraints (Figure 10, Figure 6–10).

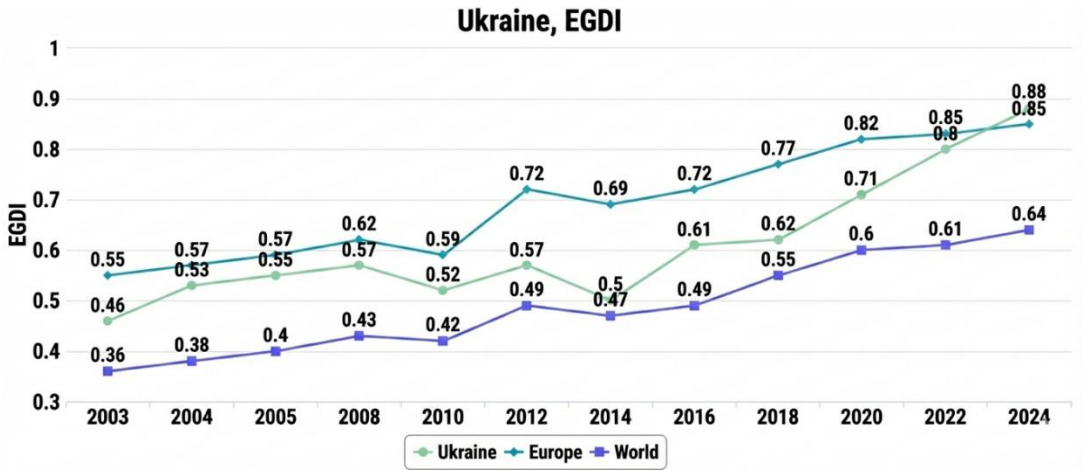


Figure 10. EGDI historical, comparative

Source: [30]

Ukraine's achievement of 3rd place in the EU's Open Data Maturity assessment, surpassing member states like Estonia, Ireland, Spain, and signals a profound commitment to governmental transparency and a data-driven economy [22]. The top-tier ranking reflects a mature open data ecosystem that functions as a critical anti-fragmentation tool. By standardizing data formats and ensuring interoperability, it provides the essential raw material for innovation, allowing both public institutions and private FinTechs to develop new digital services on a level, competitive playing field.

These rankings validate the core thesis that a concerted, state-led digitalization strategy can effectively overcome systemic fragmentation. By building a resilient digital layer – exemplified by Diia and its integration with the financial sector – Ukraine has created a cohesive governance and economic architecture that remains functional and competitive even as its physical infrastructure is under direct attack.

In 2024, Ukraine was ranked among the top three fastest-growing ecosystems in Central and Eastern Europe (CEE) and is now the fourth largest in CEE by ecosystem value, right after Poland, Estonia, and Czechia. This ranking was determined through a combination of key metrics such as growth trajectory, startup valuations, venture funding raised, and ecosystem maturity, with Ukraine’s resilience and adaptability during the ongoing conflict contributing to its rapid development and international recognition [1; 32]. International recognition underscores the viability of Ukraine's model not just for national recovery, but as a blueprint for digital integration with the European Union, which places a high premium on both advanced e-government and robust open data policies.

Crisis as a catalyst for systemic innovation. The full-scale invasion necessitated a rapid and profound strengthening of state functions. The pre-existing digital infrastructure allowed Ukraine to respond effectively. This experience shows how a crisis can accelerate the development of a more coordinated and resilient state-led economic model. The state's ability to ensure financial continuity through digital channels was fundamental to national resilience, reinforcing its role as a guarantor of stability.

The wartime response has catalyzed a shift that moves beyond historical frameworks. The resulting hybrid platform-mediated order is a digitally coordinated access order in which platform design and code become central instruments of both constraint and inclusion.

By establishing Diia (*unified digital identity and service platform*) and a resilient state-owned bank as central *digital platforms*, the state created a unified system for service delivery through digital channels. This state-led digital public infrastructure allowed the government to streamline economic channels and allocate resources strategically. This mechanism enabled the provision of direct, efficient pathways for financial services and aid,

significantly reducing dependency on fragmented or non-state intermediaries. The digital infrastructure ensures the transparent and targeted distribution of state resources, which has been crucial for maintaining economic stability and public trust during the crisis by strengthening state coordination capacity.

The rule – based configuration: actors and principles. The integration of Diia and the state-owned bank moved economic access toward a more institutionalized and rules-based configuration. Access to state resources and financial services is increasingly mediated by digital standards such as BankID and Diia.Signature, and by automated eligibility checks embedded in the platforms, where platform code acts as the new gatekeeper. This architecture simultaneously broadens the population's access to formal financial services and government transfers, a vital factor for maintaining market function and public stability during conflict. In essence, the digital infrastructure is the new financial operating system, using code to standardize control (constraint) and maximize reach (inclusion), by creating a clear, codified framework for businesses and citizens, providing tangible benefits (aid, remote banking, traceable transactions, transparency), and reliable services. As a result, this creates new, highly formalized channels of access to state resources (digital ID, standardized screening, rule-bound cash transfers).

This transformation is co-produced by the rising agency of technical bureaucracies (MinDigital, NBU), platform architects, and key transnational digital partners (such as cloud providers, payment networks, international cybersecurity partners, and FinTech developers). These actors introduce norms and standards that align with global open-access principles. Furthermore, this transformation actively rewires Ukraine’s geopolitical role by embedding the country within international financial and diplomatic networks centered on innovation, transparency, and strategic digital sovereignty. This model presents a modern paradigm for state consolidation, where technological integration becomes the primary mechanism for overcoming fragmentation, securing economic functions, and reinforcing sovereignty in times of crisis [28].

Ukraine’s trajectory highlights the emergence of a techno-policy model for digitally-enabled state consolidation. By building a mandatory, inclusive digital ecosystem, Ukraine has enhanced its coordination capacity, fostered economic inclusion, and secured key state functions. This techno-political approach has not only supported wartime resilience but is also setting the policy architecture for long-term recovery, regulatory modernization, and alignment with European digital governance standards.

Integration context. Digital governance has emerged as a transformative force reshaping the country’s geopolitical positioning, integration into international financial networks, and diplomatic leverage.

Firstly, Ukraine’s accelerated wartime digital transformation serves as a powerful signal of resilience and state modernization to international partners.

The institutionalization of "state in a smartphone" through Diia and investment in cloud-based resilience represent not only technological progress but a redefinition of state capacity aligned with European governance and digital norms. Diia City in particular, launched just two weeks before the invasion, is a tool intentionally designed to make it easier and more appealing for foreign companies to set up and run operations within Ukraine. Diia City is a "virtual free economic zone for tech companies in Ukraine" that offers a variety of legal and tax benefits. It aims to play a vital role in positioning Ukraine as a European tech powerhouse [24; 25; 26].

By open-sourcing the Diia platform, Ukraine has positioned itself as a leader in digital public infrastructure, enabling other countries to adopt and tailor its governance solutions [1]. This enhances Ukraine's credibility and attractiveness as a digital partner in a multipolar global order [19].

Secondly, the integration of digital identity and financial services platforms, notably the Diia–PrivatBank nexus, standardizes Ukraine's financial infrastructure to meet EU and global compliance requirements. This facilitates cross-border capital flows, incorporation into international payment systems, transparent state aid distribution, and alignment with emerging transnational FinTech ecosystems. Cloud infrastructure ensures operational continuity despite war damages, reinforcing trust among international investors and donors, which amplifies Ukraine's financial connectivity and macroeconomic stability [19; 14; 25].

Thus, Ukraine's digital governance infrastructure is a critical techno-political tool that extends far beyond national resilience. It actively rewires Ukraine's geopolitical role by embedding the country within international financial and diplomatic networks centered on innovation, transparency, and strategic digital sovereignty.

Conclusions

The synergistic integration of Diia and PrivatBank created a solid foundation for a new, resilient FinTech ecosystem in Ukraine. This partnership established a novel anti-fragmentation architecture for the national financial system. In this new model, a robust digital layer actively leveraged and enhanced the reach of traditional banking infrastructure. This was critically important in a context where physical infrastructure was fragmented or destroyed by war. The digital system, comprising verified identity and cloud-based platforms, ensured continuity and inclusion where traditional systems were compromised. Consequently, this techno-political approach did not replace the traditional system but created a hybrid architecture that secured its core functions and extended its reach, turning fragmentation into a catalyst for integrated, system-wide resilience. This architecture now provides a scalable foundation for both post-war recovery and deeper integration with the European financial space.

Furthermore, the Ukrainian case demonstrates a profound transition to a platform-mediated access order. In this emergent configuration, state-led digital public infrastructure (specifically, unified digital identity and state-controlled financial platforms) becomes the central instrument for economic coordination, formal inclusion, and crisis legitimization. This mechanism creates a new, digitized basis for state resilience where technological integration becomes the primary mechanism for overcoming fragmentation, securing economic functions, and reinforcing sovereignty in times of crisis.

Ukraine's future trajectory will depend on its ability to navigate three pivotal challenges. First, it must balance the efficiency gains delivered by a centralized digital infrastructure with the need to cultivate a competitive FinTech landscape, preventing state-driven financial concentration and ensuring financial ecosystem diversity. Second, as the system begins to integrate advanced technologies – such as AI-supported financial analytics and a potential e-hryvnia – Ukraine will need robust regulatory governance, transparent oversight mechanisms, and strict data-protection standards to maintain the financial integrity and public trust on which the system depends. Third, the digital financial architecture that sustained resilience during wartime must now be leveraged to support large-scale reconstruction, guaranteeing that digital inclusion translates into equitable access to recovery capital, loan programs, and public investment flows. Whether Ukraine succeeds in these domains will determine if its anti-fragile digital foundation can evolve into a stable financial architecture for an open and sustainable post-war economy.

References:

1. Mamediieva G. (2025). "Ukraine's Digital Transformation: Innovation for Resilience." Harvard.edu. Available at: www.hks.harvard.edu/centers/cid/voices/ukraines-digital-transformation-innovation-resilience.

2. Sirtaine S., Torre A. (2024). Ukraine's Diia: A Digital Lifeline in Times of Crisis. (2024, October 24). CGAP. Available at: https://www.cgap.org/blog/ukraines-diia-digital-lifeline-in-times-of-crisis

3. Bandura, R., & Staguhn, J. (2023). Digital Will Drive Ukraine's Modernization. Www.csis.org. Available at: https://www.csis.org/analysis/digital-will-drive-ukraines-modernization

4. "PrivatBank under State Protection." PrivatBank under State Protection, 2016. Available at: https://pb.bank.gov.ua/en.html#chronology.

5. Iwański T. "Oligarchs Making Gains: The Costly Nationalisation of Ukraine's PrivatBank." OSW Centre for Eastern Studies, 21 Dec. 2016. Available at: https://www.osw.waw.pl/en/publikacje/analyses/2016-12-21/oligarchs-making-gains-costly-nationalisation-ukraines-privatbank.

6. "The Ministry of Digital Transformation of Ukraine." Digital Skills and Jobs Platform, 2019. Available at: https://digital-skills-jobs.europa.eu/en/community/networking/organisations/ministry-digital-transformation-ukraine

7. “Digital State.” Diia.gov.ua, 2018. Available at: https://expo.diia.gov.ua/#about-diia. https://expo.diia.gov.ua/#about-diia

8. The Path towards E-Governance in Ukraine. (2021, March 17). E-Governance Academy. Available at: https://ega.ee/path-towards-egovernance-ukraine/

9. Portal “biudzhet dlia hromadian” [Portal “Budget for Citizens”]. Openbudget.gov.ua. Available at: https://openbudget.gov.ua/en/about-portal

10. Digital State UA. (2025, April 24). Ukraine, EU, and eGA Deliver 150+ Digital Services Through the DT4UA Project. Digitalstate.gov.ua; Digital State UA. Available at: https://digitalstate.gov.ua/news/govtech/ukrayina-yes-ta-ega-zaprovadyly-ponad-150-tsyfrovykh-posluh-u-mezakh-proyektu-dt4ua

11. New ‘e-Entrepreneur’ app to offer comprehensive services for Ukrainian businesses (2024). EU4Digital. Available at: https://eufordigital.eu/new-e-entrepreneur-app-to-offer-comprehensive-services-for-ukrainian-businesses/

12. Global Government Technology Centre in Kyiv - How Ukraine Reduces Bureaucracy and Improves Business Climate. Available at: https://www.kyivgovtechcentre.org/business-climate

13. Ukraine is digital by design: Resilience and trust, embedded in governance. (2025, July 2). E-Governance Academy. Available at: https://ega.ee/ukraine-digital-by-design/

14. Ravi, K. (2025). Socio-Technical System Challenges in the Era of Artificial Intelligence: A Comprehensive Analysis. International *Journal of Business & Management Studies*, no. 06(09), pp. 75–91. DOI: https://doi.org/10.56734/ijbms.v6n9a8

15. Motkin A. (2023). Ukraine’s Diia platform sets the global gold standard for e-government. Atlantic Council. Available at: https://www.atlanticcouncil.org/blogs/ukrainealert/ukraines-diia-platform-sets-the-global-gold-standard-for-e-government/

16. Fintech development in Ukraine. (2025). National Bank of Ukraine. Available at: https://bank.gov.ua/en/about/develop-strategy/fintech2025

17. Financial Sector Development. (2025). National Bank of Ukraine. Available at: https://bank.gov.ua/en/about/develop-strategy

18. “Digital State.” Diia.gov.ua, 2018, expo.diia.gov.ua/#about-diia. Available at: https://expo.diia.gov.ua/#about-diia

19. “How Ukraine’s Digital State Is Driving Resilience and Reinvention.” Berlinglobaldialogue.org, 2025. Available at: https://www.berlinglobaldialogue.org/resources/how-ukraine-is-developing-digital-leadership-in-a-multipolar-world.

20. “PrivatBank Case Study.” Amazon Web Services, Inc., 10 Nov. 2025. Available at: https://aws.amazon.com/solutions/case-studies/privatbank-case-study/#:~:text=With%20support%20from%20Amazon%20Web,just%202%20months%2C%20minimizing%20business

21. E-Government Survey 2024. Available at: https://desapublications.un.org/sites/default/files/publications/2024-10/Technical%20Appendix%20%28Web%20version%29%2030102024.pdf

22. Digital State UA. “Ukraine’s GovTech Topping Global Rankings.” Digitalstate.gov.ua, Digital State UA, 9 Feb. 2025. Available at: https://digitalstate.gov.ua/news/govtech/ukraines-govtech-topping-global-rankings.

23. World Bank Data360, 2025. Available at: https://data360.worldbank.org/en/indicator/UN_EGDI_EGDI?view=trend&country=UKR.
24. Delivering Digital Transformation in Ukraine. (2023). Available at: https://www.chandlerinstitute.org/governancematters/delivering-digital-transformation-in-ukraine
25. Bandura, R., & Staguhn, J. (2023). Digital Will Drive Ukraine's Modernization. Available at: https://www.csis.org/analysis/digital-will-drive-ukraines-modernization
26. Schroeder E. (2025). Building the digital front line: Understanding big tech decision-making in Ukraine. Atlantic Council. Available at: https://www.atlanticcouncil.org/in-depth-research-reports/report/building-the-digital-front-line/
27. Financial Sector Development. (2025). National Bank of Ukraine. Available at: https://bank.gov.ua/en/about/develop-strategy
28. Ingram, G., Priya V. (2024). "Ukraine: Digital Government Is Central to Resilience." Brookings. Available at: www.brookings.edu/articles/ukraine-digital-government-is-central-to-resilience/.
29. European Commission. (2019). Digital government factsheet: Ukraine. National Interoperability Framework Observatory. Available at: https://interoperable-europe.ec.europa.eu/sites/default/files/inline-files/Digital_Government_Factsheets_Ukraine_2019.pdf
30. United Nations. (2024). Ukraine. UN E-Government Knowledgebase. Available at: https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/180-Ukraine
31. Tymots M. (2025) Analiz trendiv ta perspektyv tsyfrovoho bankinhu v Ukraini [Analysis of trends and prospects of digital banking in Ukraine]. *International Science Journal of Management Economics & Finance*, vol. 4, no. 5, pp. 23–32. DOI: https://doi.org/10.46299/j.isjmef.20250405.03.
32. Coteneanu A. (2025). "Blog." Blog, 28 Mar. 2025. Ukraine – Resilience, Grit, Digitalisation & Fintech Development. Available at: https://blog.unchainfestival.com/ukraine-resilience-grit-digitalisation-fintech-development/
33. Revised Strategy of Ukrainian Financial Sector Development: Preserving Stability, Raising Investment, and Integrating with Europe. Available at: https://mof.gov.ua/en/news/onovlena_strategiia_rozvitku_finansovogo_sektoru_ukraini_zberezhennia_stabilnosti_zaluchennia_investitsii_ta_ievrointegratsiia-5276.
34. Bryant, Wes J. "When a CEO Plays President: Musk, Starlink, and the War in Ukraine." Irregular Warfare Initiative. Available at: https://irregularwarfare.org/articles/when-a-ceo-plays-president-musk-starlink-and-the-war-in-ukraine/.
35. Ionan V. "GovTech Intelligence Hub." Govtechintelhub.org, 2025. Available at: https://www.govtechintelhub.org/case-study-details/ukraine.
36. Davydiuk, A, Potii O. Tallinn (2024). National Cybersecurity Governance: UKRAINE. Available at: https://ccdcoe.org/uploads/2024/08/National-Cybersecurity-Governance_Ukraine_Davydiuk_Potii_2024.pdf
37. Thian S.Y. (2025). Ukraine to monetise its superapp Diia and introduce AI assistant for government services. (2020). Govinsider.asia. Available at:

https://govinsider.asia/intl-en/article/ukraine-to-monetise-its-superapp-diia-and-introduce-ai-assistant-for-government-services

38. Trist E. (1981). The evolution of socio-technical system: a conceptual framework and an action research program. Quality of working life. *A series of occasional papers*, no. 2. Available at: https://ia800202.us.archive.org/21/items/39120320010110/39120320010110.pdf

39. Normative Acts of Ukraine in the Sphere of Electronic Trust Services and Electronic Identification. Available at: https://czo.gov.ua/en/normative-documentation

40. Reform Radar: Tracking Ukraine's Digital Transformation in 2019-2024. Available at: https://voxukraine.org/wp-content/uploads/2025/06/Digital-Reform-Report_eng.pdf

41. Ukraine. (2025). Interoperable Europe Portal. Available at: https://interoperable-europe.ec.europa.eu/collection/iopeu-monitoring/ukraine?utm_source=chatgpt.com

42. Bergmann, J., Kosmehl, M., Langbein, J., & Sasse, G. (2024). Multiple Missions in the Midst of War: Integrating Ukraine's Recovery and EU Accession. (Policy Brief 11/2024). IDOS. DOI: https://doi.org/10.23661/ipb11.2024