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INNOVATIONS IN BUSINESS: REALITIES AND DIRECTIONS FOR DEVELOPING COOPERATION IN WARTIME

Abstract. The article examines the forced changes in the innovation activities of Ukrainian businesses under the conditions of the full-scale invasion. The key challenges are examined, particularly the relocation of enterprises, the destruction of supply chains, and the loss of markets, which have necessitated the accelerated implementation of innovations. The primary directions of innovative business development are identified, encompassing diversification, accelerated digitalization, and the creation of new business models. Special attention is paid to the analysis of new forms of cooperation, particularly public-private partnerships and the interaction between business and the volunteer sector. As a result, it is established that the synergistic effect of flexible cooperation becomes a key factor in enhancing resilience and driving further innovative development of Ukrainian businesses.

Keywords: innovations, business, martial law, cooperation, digitalization, resilience, public-private partnership.

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ІННОВАТИКА В БІЗНЕСІ: РЕАЛІЇ ТА НАПРЯМИ РОЗВИТКУ СПІВПРАЦІ В УМОВАХ ВІЙНИ

Анотація. У статті проаналізовано вимушені зміни інноваційної діяльності українського бізнесу в умовах повномасштабного вторгнення. Досліджено ключові виклики, зокрема релокацію підприємств, руйнування логістичних ланцюгів та втрату ринків, що зумовили необхідність прискореного впровадження інновацій. Визначено основні напрями інноваційного розвитку бізнесу, що включають диверсифікацію, прискорену цифровізацію та розробку нових бізнес-моделей. Особливу увагу приділено аналізу нових форм співпраці, зокрема державно-приватного партнерства та взаємодії бізнесу з волонтерським сектором. В результаті встановлено, що саме синергетичний ефект від гнучкої співпраці стає ключовим чинником стійкості та подальшого інноваційного розвитку українського бізнесу.

Ключові слова: інновації, бізнес, воєнний стан, співпраця, цифровізація, стійкість, державно-приватне партнерство.

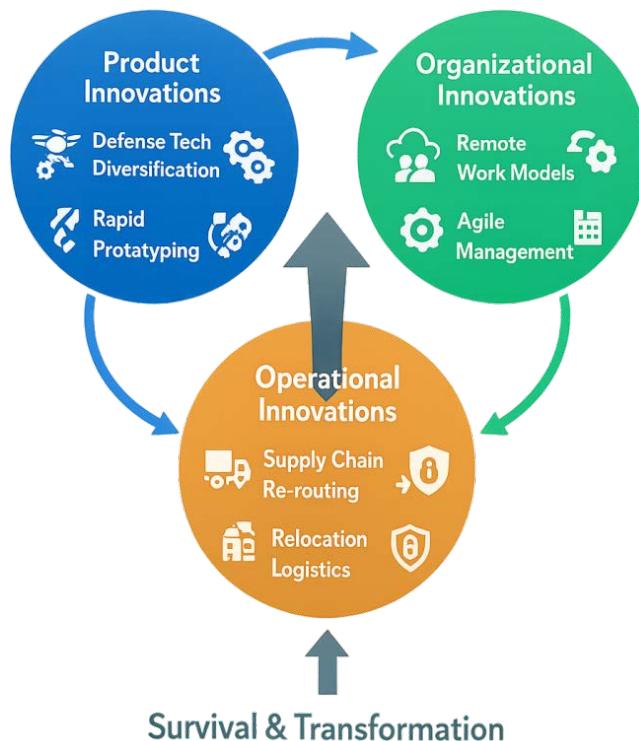
Introduction. The full-scale invasion of Ukraine triggered a severe economic crisis, placing immense strain on its private sector. Businesses found themselves grappling with a cascade of problems: destroyed facilities, broken supply chains, displaced workforces, and evaporated markets. This new reality demanded a fundamental pivot in business innovation. No longer a strategy for long-term market leadership, innovation became a critical tool for day-to-day survival. This environment has spurred the rapid development of new operational models and previously unseen levels of flexible cooperation.

While Ukrainian scholars like S. Oneshko [2], and V.V. Nebrat [3] have previously published works on innovation management and business resilience, their research largely predates the current full-scale conflict. A distinct gap exists in the literature regarding the specific dynamics of innovation during wartime. In particular, the unique collaborative frameworks emerging between private companies, government bodies, and civil society actors remain largely unexamined by academia. This topic, while frequently covered in business-focused media [5], still awaits systematic scholarly investigation.

Statement of the problem. The purpose of the article is to analyze the realities of innovative activity in Ukrainian business under wartime conditions, and to identify the primary

directions for the development of cooperation, particularly between the private sector, state institutions, and civil society.

Research results. The full-scale war plunged Ukrainian businesses into an environment of constant crisis and extreme uncertainty. The research identified several primary challenges that became powerful, though destructive, drivers for innovation: the physical destruction of assets, forced enterprise relocation, disrupted supply chains, and a sharp collapse in both domestic and export markets. Analysis of these responses shows that the majority of early innovations were not proactive growth strategies. Instead, they were reactive necessities, fundamentally driven by the need to survive. These adaptations can be grouped into three main categories: operational, organizational, and product. The interplay and evolution of these innovation types under wartime pressure are summarized in Figure 1.



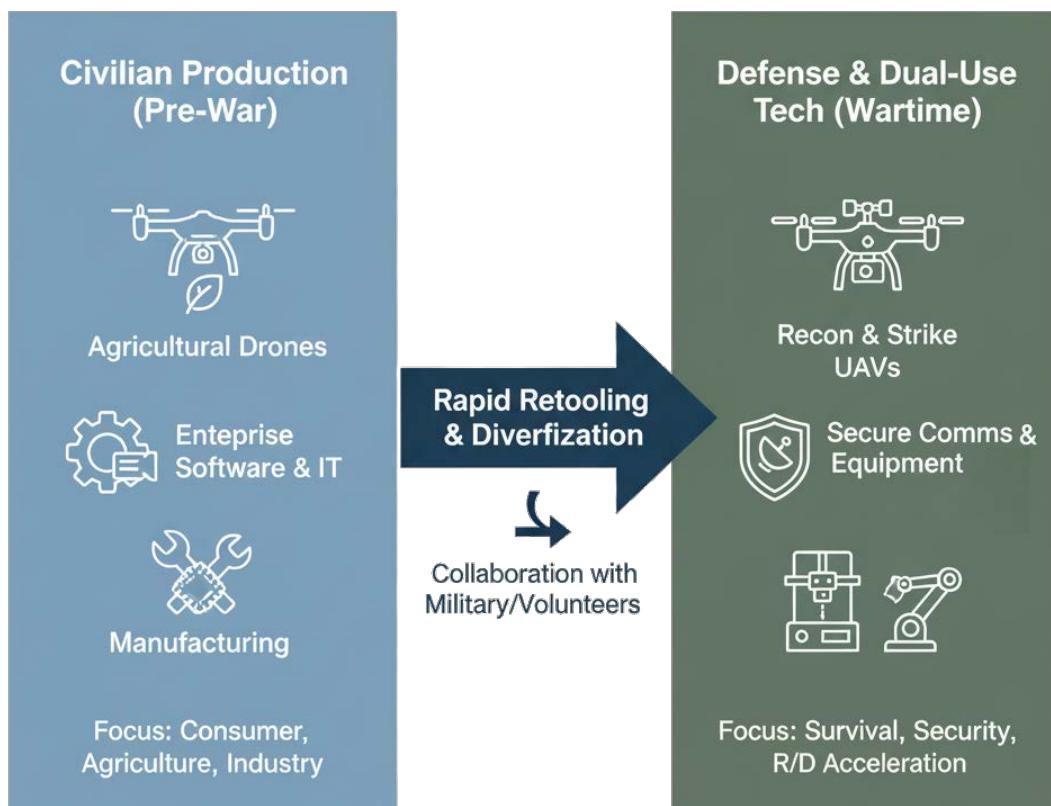
Source: developed by the authors based on [1].

Figure 1. Key Categories of Business Innovations in Wartime Ukraine

The most visible innovative response was product diversification, specifically the significant shift of civilian companies into the Defense Technology sector. This shift was not planned. It was a direct reaction to a dual shock. On the one hand, traditional consumer demand collapsed. On the other hand, an urgent and massive need for military supplies emerged from the state. Business media, such as Forbes [5], have extensively documented this pivot. Companies that once manufactured agricultural drones, for example, quickly found ways to adapt them for reconnaissance purposes. Software firms retooled enterprise systems for logistics or even targeted specific markets. It was not simple opportunism. It was a matter of adaptation, and its success was often built on new forms of cooperation. Volunteer groups and military units on the front line provided instant feedback, a process that bypassed traditional R&D cycles entirely. This transition from conventional manufacturing to the development of dual-use and defense products is illustrated in Figure 2.

The private sector also faced a forced revolution in operational innovation. The war effectively destroyed Ukraine's existing logistics. With the blockade of Black Sea ports – the main export artery – and the destruction of critical infrastructure, the situation seemed hopeless.

However, this crisis did not lead to a complete standstill. Instead, it prompted businesses to seek new transport routes and rethink their supply chains. Companies were forced to innovate, massively redirecting air and sea transport operations to rail and road transport across western borders. In addition to logistics, this process itself became a significant innovation. Hundreds of businesses were forced to relocate from eastern and southern Ukraine to western regions. It was much more than a simple move – it was an unprecedented logistical and managerial challenge that forced companies to rebuild their entire operations from scratch in new locations, often with the support of government programs.



Source: developed by the authors based on [1].

Figure 2. Transition of Civilian Production to Defense Technology in Wartime

This mass relocation, affecting over 800 enterprises according to official government data [4], is a core component of this operational and managerial innovation. To illustrate the nature of these adaptations, Table 1 provides specific examples of companies that have successfully moved and the key innovative solutions they implemented to restart operations.

As Table 1 shows, innovative solutions went far beyond physical relocation. For manufacturing companies, the main innovation was the redesign of their entire logistics network with a focus on the west, away from traditional routes and combat operations [8]. For the IT sector, innovation was organizational in nature, consisting of establishing distributed team models. These data emphasize that relocation was not just a survival tactic but a powerful catalyst for a fundamental transformation of the business model.

Alongside these changes in products and operations, the study revealed profound organizational innovations. These were driven primarily by the mass relocation of the workforce and the physical destruction of office space. The chaotic environment compelled many companies to rapidly and inevitably transition to digital technologies, far exceeding their initial plans. Companies that had previously been hesitant to implement remote working were forced to adopt complex distributed team models almost overnight. It was not just a technical

transition to cloud services, but a fundamental management innovation. This required the widespread implementation of new flexible management structures and asynchronous work processes to maintain operational coordination and productivity. This process acquired organizational flexibility, which proved to be a critical prerequisite, laying the necessary foundation for new models of collaboration that became a defining feature of Ukraine's business resilience in wartime.

Examples of Business Relocation and Innovative Adaptation in Wartime

Table 1

Company / Industry	Original Region	Relocation Region	Key Innovative Solution / Adaptation
"Kramatorsk Heavy Engineering" (Mfg.)	Kramatorsk, Donetsk Oblast	Lviv Oblast / Dnipro	Partial relocation of critical equipment; established new supply chains via EU borders; focused on repair services over new production
"UkrKhimPlast" (Chemical Mfg.)	Kharkiv Oblast	Chernivtsi Oblast	Full production line relocation; re-certified under EU standards to target new export markets; innovated in waste-reduction to cut costs.
"IT Dev Solutions" (Software / IT)	Mariupol / Kharkiv	Multiple (Remote) / Hub in Uzhhorod	Shifted to a 100% "work from anywhere" model; established a small legal/financial hub in a safe zone; pivoted to cybersecurity contracts.
"Slobozhanskyi Agro" (Food Processing)	Sumy Oblast	Ternopil Oblast	Lost primary resource base; innovated by sourcing raw materials from local western-region farms; developed new product lines.

Source: *developed by the authors based on [4, 5, 8]*.

This new model of cooperation was the main conclusion of the study. The war effectively destroyed the traditional barriers that separated "business", "government" and "civil society". Under enormous pressure, these actors were compelled to form hybrid partnerships, thereby creating a new, highly effective mechanism for addressing real-world problems swiftly. This tripartite cooperation became the driving force behind both defense and economic stability.

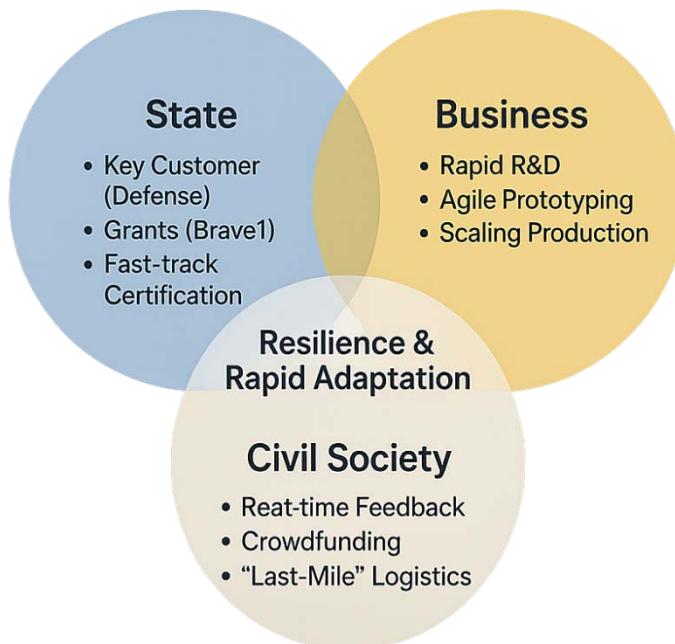
The role of the state was particularly transformative. Going beyond its traditional function as a regulator, the government became a key customer and driver of innovation. A striking example relevant to the defense pivot discussed earlier is the Brave1 defense technology cluster. The platform was specifically created to bring together public and private entities, provide grants, optimize military testing, and bridge the bureaucratic gap between developers and the Ministry of Defense. This partnership between the state and business, as highlighted in the business media, is vital for scaling innovation from prototype to ready-to-use product, demonstrating a new, more agile form of public-private partnership.

At the same time, civil society and the volunteer sector have taken on an unprecedented role as rapid accelerators and validators of products. As mentioned in the context of innovation, volunteer groups provide instant, real-world feedback from users on the front lines – a function that traditional corporate R&D cannot match. In addition, they have proven adept at crowdfunding early-stage R&D for niche solutions and managing last-mile distribution, often filling critical gaps faster than any official bureaucracy. It creates a direct feedback loop: businesses innovate, volunteers test and fund, and the government, observing this success, can step in to support scaling.

Additionally, the study found significant growth in B2B collaboration. Faced with supply chain disruptions and resource shortages, many companies, including former

competitors, have begun forming new alliances. This includes sharing logistics capacities on new critical transport chains [8], co-locating production in relocated facilities, and creating joint purchasing groups to source raw materials from new EU markets. Such cooperation demonstrates a shift from purely competitive thinking to a "cooperation" model, where joint survival and national goals temporarily outweigh individual interests in market share.

The forced complex interaction between the state, private enterprise, and civil society has created a new path for finding innovative solutions. Although the roles are fluid, they can be broadly summarized as a tripartite model, as shown in Figure 3.



Source: developed by the authors based on [10]

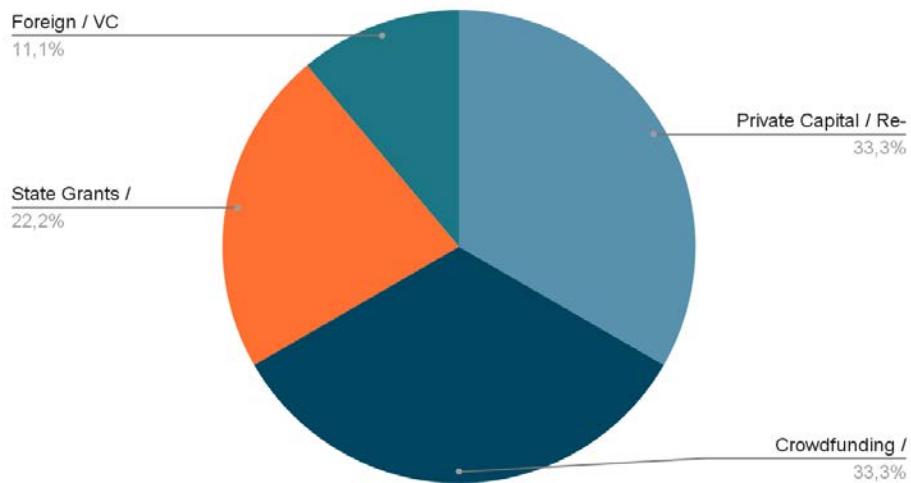
Figure 3. The Tripartite Model of Wartime Cooperation Source

In addition to cooperation models, financing is a critical factor determining the "realities" of innovation. The war has radically changed the financing landscape. Traditional venture capital investments, particularly those from foreign funds, have declined sharply due to changes in risk perceptions [7]. However, this gap has been partially filled by a new hybrid capital model. This model incorporates government grants [6], substantial private investments from Ukrainian businesspeople, and a notable increase in crowdfunding through volunteer funds and platforms. This new financial structure, which differs significantly from pre-war models, is summarized in Figure 4.

Finally, to present a complete picture of the "realities", it is crucial to note the significant barriers that persist. While platforms like Brave1 [6] have reduced bureaucracy, many businesses still report challenges in scaling production due to complex state procurement processes and a lack of long-term, predictable state contracts [5, 7]. Furthermore, the reliance on short-term crowdfunding, while effective for prototypes, does not provide the stable capital needed for sustained, in-depth research and development (R&D). Lastly, the "brain drain" – the migration of highly skilled specialists and engineers – remains a critical threat to the long-term sustainability of this innovative ecosystem.

Conclusions. The full-scale war has served as a powerful, albeit destructive, catalyst for innovation within the Ukrainian business sector. Faced with existential threats – including physical destruction, logistical collapse, and mass displacement – companies were compelled to adapt in order to survive. This adaptation manifested in three key areas: product innovation, operational innovation, and organizational innovation.

Key Funding Sources for Wartime Innovation



Source: developed by the authors based on [6, 7].

Figure 4. Illustrative Funding Sources for Wartime Innovation

The central finding of this article is that the key to Ukrainian business resilience lies not in any single innovation, but in creating a unique, agile, and collaborative ecosystem. The traditional barriers between the private sector, state institutions, and civil society have been dismantled, replaced by a synergistic, trilateral partnership. This cooperation allows for the rapid development, funding, validation, and deployment of new solutions.

Despite persistent challenges such as bureaucracy, unstable financing, and the critical threat of "brain drain", this new model of flexible, mission-oriented collaboration is the most significant innovation of all. It provides a robust framework for Ukraine's current resilience and forms a critical foundation for future postwar economic recovery and modernization.

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