

“Organizational efficiency in the context of e-business: Evidence from Ukrainian companies”

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ORGANIZATIONAL EFFICIENCY IN THE CONTEXT OF E-BUSINESS: EVIDENCE FROM UKRAINIAN COMPANIES

Abstract

This study underscores the growing significance of e-business as a key driver of economic development and competitiveness in Ukraine. The primary objective is to identify and analyze the factors that influence the organizational efficiency of Ukrainian e-business enterprises, with particular attention given to those factors that are directly subject to managerial influence. The research methodology is grounded in empirical data obtained through a structured survey of 80 e-businesses operating across various sectors, including e-commerce, e-learning, software development, and digital media. Analytical methods comprised descriptive statistics, non-parametric correlation analysis, and visual data representation to explore the distribution patterns and independencies among key performance indicators. The findings reveal a substantial range in annual turnover, spanning from €70,280 to €21,876,800, with an average value of €995,761. Net profit values vary from €12,650 to €3,719,056, averaging €216,153. The profitability of the surveyed enterprises ranges between 5% and 53% with a mean rate of 24.74%. A statistically significant, strong positive correlation ($r = 0.7$, $p < 0.001$) was identified between the number of employees and net turnover, indicating the critical role of human resources in driving enterprise performance. The analysis further identifies organizational and legal structure, as well as the size and qualification of the workforce, as key determinants of operational efficiency within e-business environments. The study concludes that effective managerial oversight of human resources is essential for enhancing organizational performance and enabling strategic decision-making, thereby supporting long-term competitiveness and sustainable development in Ukraine's digital economy.

Keywords

digitalization, e-business, management, performance, profitability

JEL Classification

M21, M10

INTRODUCTION

In the context of the ongoing transformation of the Ukrainian economy, e-business has emerged as a critical catalyst for innovation, enhanced competitiveness, and integration into the global digital landscape. The rapid pace of technological advancement, the increasing prevalence of remote services, and the evolution of consumer behavior are compelling enterprises to adopt digital tools as integral components of their operations. Under these conditions, e-business is no longer perceived merely as an auxiliary sales channel but has evolved into a comprehensive business model that demands strategic management and adaptive organizational development.

Enhancing the efficiency of e-business enterprises has become a pressing issue, necessitating not only technological modernization but also the reconfiguration of management functions and processes. Organizational efficiency in the e-business sector is significantly influenced by internal managerial decisions, which must be aligned with contemporary digitalization trends to ensure sustainable growth

and competitiveness. Therefore, the analysis of performance factors through clearly defined managerial indicators becomes essential for developing strategic frameworks tailored to the needs of small and medium-sized enterprises operating in Ukraine's digital economy.

1. LITERATURE REVIEW

The swift development of the digital economy is fundamentally reshaping corporate operations and management practices on a global scale (Chen, 2023; Jiang, 2020; Tan et al., 2017; Wynn, 2022). Specifically, e-business has emerged as a vital element within numerous enterprises, facilitating access to expanded markets, enhancing operational efficiencies, and bolstering competitive advantage (Alsharari, 2021; Smith, 2003). Notwithstanding these technological evolutions, the fundamental objective of enterprises remains consistent: to generate profit while ensuring operational efficiency (Amit & Zott, 2001; Kauffman et al., 2010). Attaining this objective necessitates that managers adapt their strategies and optimize organizational processes to sustain high performance levels within the context of the ongoing digital transformation (Al-Somali et al., 2010; Onyemaechi et al., 2019).

Managers bear the responsibility of maintaining operational efficiency in the face of multifaceted external and internal environmental influences (Owusu et al., 2021; Yu, 2004). External factors encompass economic conditions, technological innovations, competitive pressures, and regulatory frameworks, all of which can substantially impact organizational performance (Srivastava & Thomson, 2007). Conversely, internal factors – including organizational structure, resource allocation, and technological infrastructure – are within managerial influence (Johnson & Whang, 2003; Wagner & Sweeney, 2011). Recognizing the capacity of managers to affect internal environmental variables underscores the importance of strategic focus on these controllable factors to improve overall organizational efficiency (Fisher et al., 2007).

The genesis of e-business can be traced back to the 1960s when the foundational technological and conceptual developments laid the groundwork for digital commerce. Rapid advancements in information and communication technologies, coupled with the increasing integration of com-

puter networks, facilitated the evolution of electronic business activities (Brzozowska & Bubel, 2015; Kraus et al., 2020; Soegoto et al., 2018). The significant acceleration in the development of e-business occurred in the early 2000s, coinciding with notable progress in scientific and technological domains, including broadband connectivity, mobile technologies, and the proliferation of internet-based platforms (Bello et al., 2002; Panigrahi, 2018; Schneider, 2007; Ukaj et al., 2020; Xu, 2019). This period marked the transition from experimental online activities to fully integrated digital business models, fundamentally altering traditional commercial paradigms (Chaffey, 2011; Sirimanne, 2021; Smith, 2004).

E-business primarily involves the digital transformation of a company's business processes, encompassing activities such as procurement, sales, marketing, customer service, and supply chain management within an electronic environment. Its core content is the migration and management of enterprise operations in digital form, enabling real-time data processing, remote access, and automation of business functions (Evans, 2001; Hackbarth & Kettinger, 2000; Huo & Ouyang, 2018; Xu, 2014). This shift aims to enhance efficiency, reduce costs, and improve customer engagement, thereby providing enterprises with a competitive edge in the modern marketplace (Andonov et al., 2021).

The scope of e-business enterprises includes both entities that operate exclusively online and those with a predominantly offline presence but which incorporate a substantial digital component into their operational processes. Pure e-business enterprises rely entirely on digital platforms for their transactions and service delivery, exemplified by online marketplaces, e-tailers, and digital service providers. Conversely, traditional integrating e-business practices often maintain physical operations but leverage digital solutions for marketing, sales, and logistics, resulting in hybrid organizational forms (Begovic, 2009; Kotler & Armstrong, 2018; Kulyk & Parmová, 2017).

A critical resource within e-business enterprises is human capital, particularly highly qualified personnel with advanced digital literacy. Employees' and managers' expertise in digital tools, data analysis, cybersecurity, and e-commerce platforms is vital for operational success (Bănescu et al., 2022; Mandel, 2017). The need for high qualifications extends to both line workers and managerial staff, emphasizing the importance of continuous skill development and technological competence across all organizational levels to adapt to rapid digital changes (Bel et al., 2019; Gold et al., 2001; Najiah et al., 2021; Rotman, 2018).

Managers in e-business enterprises play a pivotal role in ensuring organizational efficiency amid intense competition, not only on local markets but also on a global scale. They must navigate complex environments characterized by rapid technological evolution, evolving consumer expectations, and aggressive competitive strategies. Effective management in this context involves strategic decision-making focused on innovating and optimizing digital processes to sustain competitive advantage (Afridi et al., 2021; Ambrosio-Pérez et al., 2023; Humphrey et al., 2003; Paraschiv et al., 2022; Tsikalo et al., 2024).

To maintain optimal profitability, managers actively analyze external and internal environmental factors influencing the enterprise. Their influence predominantly extends to internal factors – such as organizational structure, operational procedures, and resource allocation – aimed at aligning internal capabilities with external opportunities and threats. This strategic management of internal variables enables enterprises to adapt efficiently to external pressures, improve financial performance, and foster long-term sustainability (Byukusenge et al., 2017; Lai et al., 2017; Phan, 2001).

Finally, the impact of e-business managers encompasses key financial indicators, including revenue, expenses, profits, and tax obligations. Managers utilize various tools to influence these indicators, such as selecting organizational and legal forms, implementing appropriate taxation systems, and managing human resources effectively. Adjustments in these managerial parameters directly affect financial outcomes, underscoring the strategic importance of managerial actions in shaping the fiscal health of e-business enterprises (Baiyere et al., 2020; Kim, 2016; Wong, 2013).

The development of e-business has evolved significantly since its origins in the 1960s, with rapid growth occurring in the early 2000s, driven by advancements in digital technologies. E-business involves the digital transformation of enterprise processes, encompassing both fully online entities and hybrid organizations that integrate digital practices into traditional operations. Successful e-business management hinges on highly qualified personnel, strategic analysis of internal and external factors, and managerial influence on key financial performance indicators to sustain competitiveness and profitability in a global digital environment.

The purpose of this study is to identify the factors that influence the effectiveness of e-business entities in Ukraine. The focus is on those factors that managers can directly impact through their management functions. Specific indicators are used to measure these factors. Analyzing these indicators is essential for developing effective management strategies that aim to enhance organizational efficiency and take advantage of opportunities in the digital economy. Ultimately, the findings are intended to assist Ukrainian enterprises in optimizing their e-business activities, thereby fostering sustainable growth and maintaining competitiveness in an increasingly digitalized global environment.

2. METHOD

To achieve the objectives of this study, a quantitative research approach was employed, utilizing primary data collected from 80 e-business enterprises operating in Ukraine (Kulyk, 2025). Data were obtained through a structured survey instrument disseminated via email to companies identified through publicly available contact information on their official websites. The initial outreach involved the distribution of 200 invitations, resulting in 95 affirmative responses. The survey was administered using a Google Form, which gathered data on key organizational characteristics, including legal structure, number of employees, and core financial indicators such as net turnover and profit for the year 2024. Of the 95 completed responses, 80 were deemed valid and included in the final analysis, while the remaining 15 were excluded due to incomplete or inconsistent data.

The surveyed enterprises reflect a cross-section of sectors within Ukraine’s digital economy and represent a diverse array of e-business models. The organizations operate under various legal and organizational forms, including limited liability companies, sole proprietorships without hired staff, and sole proprietorships employing additional personnel. The legal form of each enterprise influences essential managerial dimensions such as capital formation, taxation regime selection, and strategies for profit distribution - factors that are critical to internal financial resource management.

Descriptive statistical methods were applied to evaluate key indicators related to business scale, performance outcomes, and workforce size. Graphical and classification techniques were used to categorize enterprises by their respective economic activities.

In addition, Spearman’s rank correlation coefficient was employed to measure the strength and direction of the association between turnover and staffing levels among the surveyed enterprises.

3. RESULTS

The empirical study encompassed a sample of 80 e-business enterprises operating within Ukraine. The sectoral distribution of these enterprises, categorized by type of economic activity, is presented in Figure 1.

The sample consists of enterprises that operate within the digital economy and utilize digital technologies at various stages of their business activities. Specifically, it includes 28 e-commerce companies, 14 business in the field of distance education, 13 software development firms, nine online game development companies, five software as a service (SaaS) providers, and two data analysis companies. Additionally, the study features two companies involved in Internet marketing and streaming platforms, as well as one company each from the AgriTech, FinTech, and HealthTech sectors. This situation is typical for e-commerce companies in Ukraine, which in most cases operate on a B2C model, as they are focused on selling their goods and services to end consumers.

The structure of e-business enterprises is depicted in Figure 2, categorized by type of economic activity.

When analyzing the structure of the sample by type of economic activity (see Figure 2), we observe that the largest proportion of the surveyed enterprises is in e-commerce, 35%. This is followed by 18% of business involved in distance education, 16% in web development, and 11% in game development. Other types of e-business each represent less than 6% of the total surveyed enterprises. The results shown in Figure 2 illustrate that the list of activities of e-business enterprises in Ukraine is expanding due to the digitalization of various spheres of economic life. In particular, the

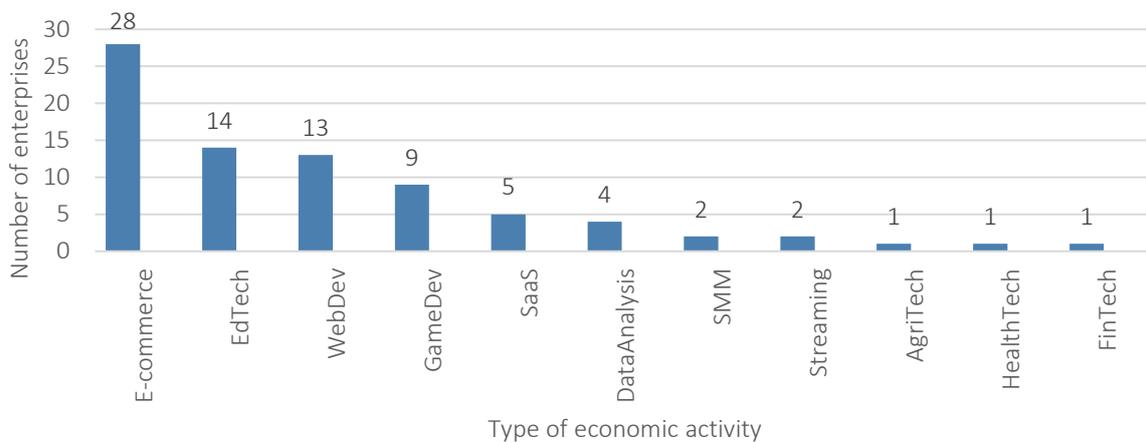


Figure 1. Economic activity categories of Ukrainian e-business enterprises participating in the 2025 survey

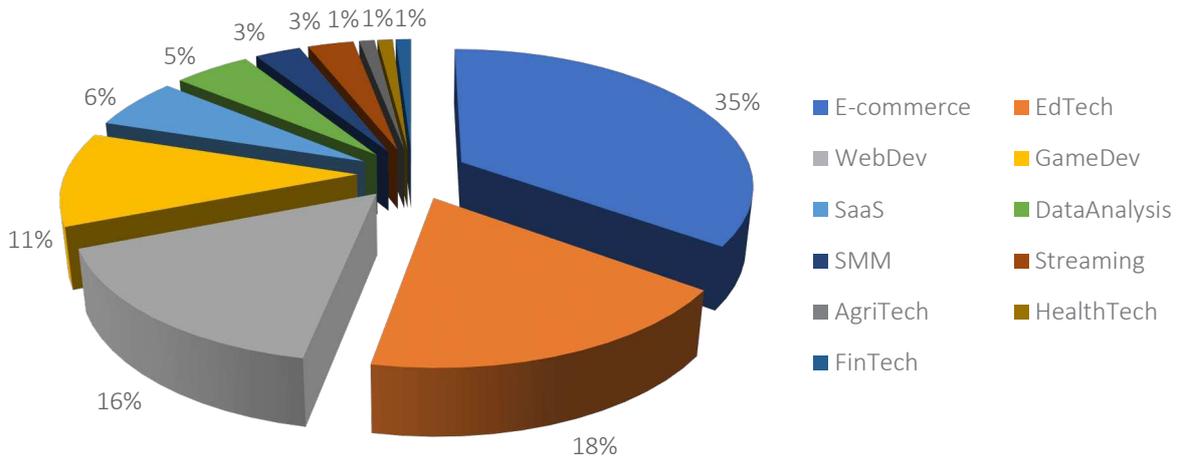


Figure 2. Sectoral composition of Ukrainian e-business enterprises surveyed in 2025

survey included AgriTech and HealthTech companies that create digital solutions for agricultural enterprises and healthcare companies.

In order to study the efficiency of e-business enterprises, we have established their organizational and legal form. The distribution of surveyed enterprises by economic activity type and organizational form is shown in Figure 3.

During the survey, we asked respondents to identify the organizational and legal form of their business entity. The majority, 47 respondents (58.8%), are individual entrepreneurs without em-

ployees. Additionally, 22 respondents (27.5%) are individual entrepreneurs with employees, while 11 respondents (13.8%) are registered as limited liability companies.

Figure 3 illustrates the distribution of limited liability companies that participated in the survey. Among these companies, there are three each from the gaming, edtech, and SaaS sectors, and one company each from the web development and e-commerce sectors. Overall, 86.2% of respondents identified their legal structure as a sole proprietorship. Sole proprietorship is the most common organizational and legal

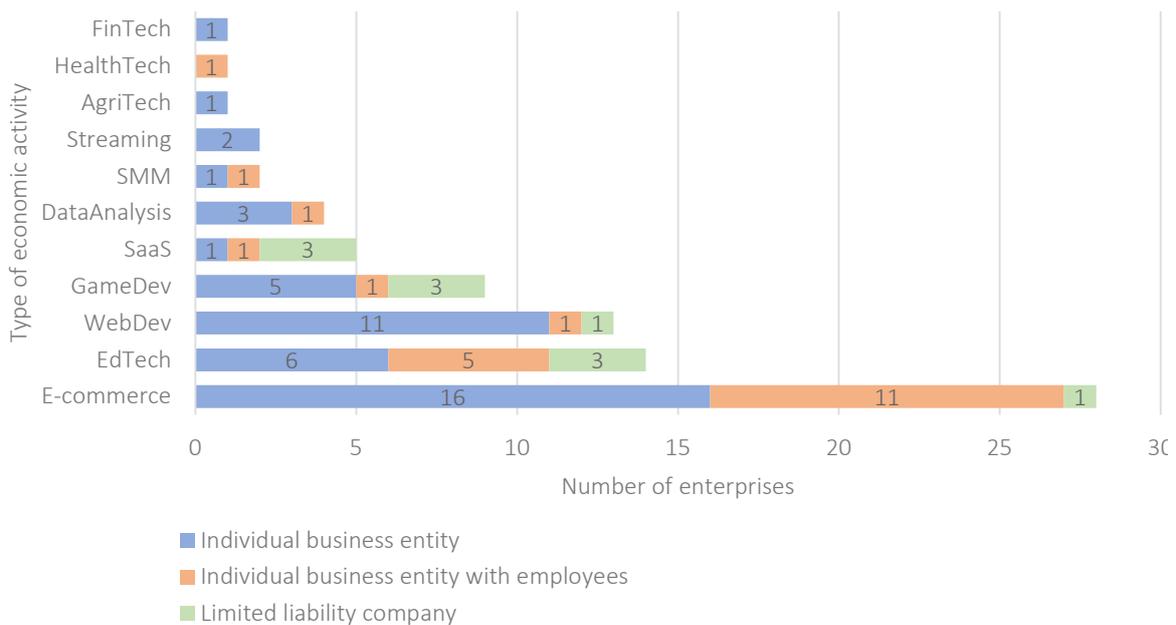


Figure 3. Structure of Ukrainian e-businesses by sector and legal form based on 2025 survey data

form in Ukraine for business entities in various fields of activity. The reason for its popularity is the lowest level of taxation available to businesses in Ukraine. However, every year the state limits the list of fields of activity and the maximum turnover that enterprises can have as sole proprietorships.

The descriptive analysis of the volume indicator for the business entities under study is presented in Table 1.

Table 1. 2024 net turnover: Descriptive metrics for Ukrainian e-businesses participating in the 2025 survey

Indicators	Net turnover (year), euro
Mean	995,760.94
Std. Deviation	2,466,719.82
Minimum	70,280
Maximum	21,876,800

Based on the information presented in Table 1, the minimum annual turnover for the sampled business entities is EUR 70,280, while the maximum annual turnover is EUR 21,876,800. The average annual turnover for the surveyed sample is EUR 995,760.94.

To utilize this indicator in subsequent calculations, we examined it for normal distribution. The results of this analysis are shown in Table 2.

Table 2. Descriptive analysis of the ‘Net turnover’ indicator for assessing normality

Indicators	Statistics	p
Kolmogorov-Smirnov	0.35	<.001
Kolmogorov-Smirnov (Lilliefors Corr.)	0.35	<.001
Shapiro-Wilk	0.27	<.001
Anderson-Darling	15.5	<.001

Table 2 shows the results of four different statistical tests used to assess whether the data follow a normal distribution. A high *p*-value (greater than 0.05) suggests that the data did not significantly deviate from normality. All four tests indicate that the data do deviate significantly from the normal distribution. This means that we should proceed with statistical methods that do not assume normality of the data.

The next indicator to be analyzed using descriptive statistics was the net profit indicator. The results of the analysis are presented in Table 3.

Table 3. 2024 net profit: Descriptive metrics for Ukrainian e-businesses participating in the 2025 survey

Indicators	Net profit (year), euro
Mean	216,152.8
Std. Deviation	451,224.36
Minimum	12,650
Maximum	3,719,056

Based on the information presented in Table 3, the minimum annual net profit for the sampled business entities is EUR 12,650, while the maximum annual net profit is EUR 3,719,056. The average annual net profit for the surveyed sample is EUR 216,152.8.

To apply this indicator in future calculations, we analyzed it for normal distribution. The results of this analysis are presented in Table 4.

Table 4. Descriptive analysis of the ‘Net profit’ indicator for assessing normality

Indicators	Statistics	p
Kolmogorov-Smirnov	0.35	<.001
Kolmogorov-Smirnov (Lilliefors Corr.)	0.35	<.001
Shapiro-Wilk	0.27	<.001
Anderson-Darling	15.5	<.001

Table 4 presents the results of four different statistical tests that assess whether the data follow a normal distribution. A high *p*-value level (greater than 0.05) indicates that the data do not significantly deviate from normality. However, all four tests show that the data significantly deviate from the normal distribution.

In addition to analyzing absolute performance indicators like turnover and profit, the analysis also examines a relative indicator used to evaluate the business performance of enterprises, enabling comparisons between businesses of varying sizes and providing a more accurate evaluation of top managers’ effectiveness. The results of this analysis are presented in Table 5.

Based on the information presented in Table 5, the minimum profitability level for the sampled busi-

ness entities is 5%, while the maximum profitability level is 53%. The average profitability level for the surveyed sample is 24.74%.

Table 5. 2024 profitability level: Descriptive metrics for Ukrainian e-businesses participating in the 2025 survey

Indicators	Profitability level, %
Mean	24.74
Std. Deviation	13.55
Minimum	5
Maximum	53

The average profitability of the surveyed enterprises by type of economic activity is illustrated in Figure 4.

Figure 4 shows the average profitability by type of economic activity in the sample. Streaming platforms have the highest level of profitability, followed by Internet marketing companies.

The next indicator that requires detailed study and is used to analyze the performance of e-business enterprises is the 'number of staff' indicator. Table 6 presents information on the minimum, maximum, and average values of this indicator.

Based on the information presented in Table 6, the minimum 'Number of staff' indicator is 2, while the maximum indicator is 68. The average indicator for the surveyed sample is 14.

To utilize this indicator in subsequent calculations, we examined it for normal distribution. The results of this analysis are shown in Table 7.

Table 6. 2024 number of staff: Descriptive metrics for Ukrainian e-businesses participating in the 2025 survey

Indicators	Number of staff
Mean	14.56
Std. Deviation	13.11
Minimum	2
Maximum	68

Table 7. Descriptive analysis of the 'Number of staff' indicator for assessing normality

Indicators	Statistics	p
Kolmogorov-Smirnov	0.15	.039
Kolmogorov-Smirnov (Lilliefors Corr.)	0.15	<.001
Shapiro-Wilk	0.92	<.001
Anderson-Darling	2.42	<.001

Table 7 shows the results of four different statistical tests used to assess whether the data follow a normal distribution. A high *p*-value (greater than 0.05) suggests that the data do not significantly deviate from normality. All four tests indicate that the data do deviate significantly from the normal distribution. This means that we should proceed with statistical methods that do not assume normality of the data.

Since the indicators 'Net turnover' and 'Number of staff' do not conform to the conditions of nor-

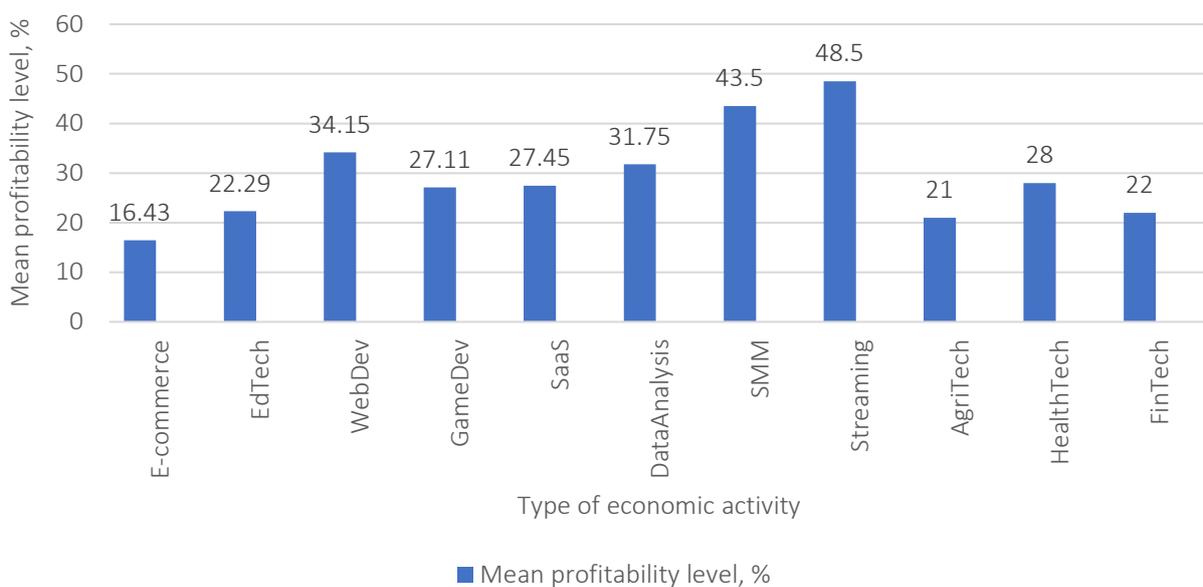


Figure 4. Mean profitability by sector for Ukrainian e-business companies surveyed in 2025

mal distribution, Spearman correlation analysis was conducted to determine the relationship between them. The results of this analysis are presented in Table 8.

Table 8. Spearman's rank correlation between net turnover and workforce size for Ukrainian e-business enterprises (2024 figures, surveyed in 2025)

Indicator	r	p
Number of staff and Net turnover (year), euro	0.7	<.001

Table 8 summarizes the results of the correlation analysis for the variables 'Number of staff' and 'Net turnover (year), euro', showing the correlation coefficient (r) and the p -value (p). The correlation coefficient indicates the strength and direction of the linear relationship. The coefficient 0.7 suggests a very high, positive correlation. This means that, generally, as 'Number of staff' increases, 'Net turnover (year), euro' also tends to increase and vice versa.

It is important to note that correlation does not imply causation, meaning that we cannot conclude from this result whether one variable influences or causes changes in the other.

The p -value is used to assess if the available data provide sufficient evidence to reject the null hypothesis. The null hypothesis states that the correlation between 'Number of staff' and 'Net turnover (year), euro' in the population is zero. In most research, a p -value less than 0.05 is considered statistically significant. Here, the p -value of <.001 is less than 0.05, which suggests that the correlation observed in the sample ($r = 0.7$) is unlikely to be due to chance. The null hypothesis is therefore rejected. The result of the Spearman correlation thus showed that there was a statistically significant correlation between 'Number of staff' and 'Net turnover (year), euro', $r(78) = 0.7, p = <.001$.

4. DISCUSSION

This study conceptualized e-commerce enterprises as a specific type of e-business enterprise. But the classification of businesses within the domain of e-business and e-commerce remains a subject of ongoing scholarly debate. Some scholars distin-

guish e-commerce as a discrete category characterized primarily by online transactional activities, thereby separating it from broader e-business operations, which may encompass a wider range of digital processes such as supply chain management, customer relationship management, and digital marketing (Chen et al., 2022; Numberger & Rennhak, 2005; Senn, 2000). This differentiation arises from the unique characteristics and operational complexities associated with each type, with e-commerce often viewed as a subset within the larger conceptual framework of e-business. Such distinctions are important for understanding the scope of digital activities and tailoring management strategies accordingly.

To study the factors that influence the effectiveness of e-business enterprises at the stage of their creation and operation, scientists propose various methods. In particular, Hackbarth and Kettinger (2000) suggest using SWOT analysis to build a development strategy. Evans (2001) suggests focusing on developing a marketing strategy designed to satisfy user needs as fully as possible. Czuchry and Yasin (2003) emphasize the need to use the Baldrige model to manage and integrate various aspects of activities, resources, and decisions in the field of e-business into a practical organizational strategy.

Given the political and economic situation in Ukraine, research is based on the understanding that e-business enterprises have limited opportunities to influence external factors. Therefore, we focused on indicators that reflect the results of their activities and tried to establish relationships with the factors that influence them.

Beyond traditional financial metrics such as revenue, profit, and profitability, the evaluation of a business's performance typically involves a comprehensive analysis of cost-related indicators, including cost structures and efficiency metrics, among others. These indicators are crucial for assessing operational efficiency and strategic effectiveness. In this study, the focus was primarily placed on the most critical indicators - revenue, profit, and profitability - due to their direct relevance to managerial decision-making and overall business sustainability, especially under the conditions imposed by martial law. However,

it is acknowledged that a broader set of performance indicators could provide a more nuanced understanding of business health and operational efficiency.

In terms of resource utilization, e-businesses rely on a spectrum of resources, including human, financial, and material assets. The present study, conducted in 2025, concentrated predominantly on human resources. This focus stems from the recognition that human capital – the skills, knowledge, and digital literacy of employees – remains the most directly controllable resource by e-business managers, particularly in the context of martial law where resource stability is uncertain. Material resources, such as physical infrastructure and technological equipment, are more susceptible to sudden loss, limiting managerial influence over them. Similarly, financial resources in the e-business environment are often subject to external regulatory and policy decisions, limiting the extent to which managers can directly control their management and allocation. Consequently, emphasizing human resources provides a pragmatic approach to understanding managerial influence on business performance under the present conditions.

The data utilized in this study were categorized by the end of 2024, with collection taking place during the period of martial law in Ukraine. Legally, companies operating under martial law are permitted not to disclose certain financial information, which presents a significant limitation. The majority of the entities included in the study are registered as individual entrepreneurs; under

Ukrainian legislation, this legal form does not mandate the preparation or public disclosure of financial statements. These entities report their income and employment figures to tax authorities using standardized forms, but are not required to provide detailed financial performance indicators, particularly under the simplified taxation system. Consequently, data on profitability used in this study were obtained from informational reports provided by the enterprises themselves.

The accuracy of the self-reported data could not be independently verified against official sources or publicly available information. As the data were provided voluntarily and at the discretion of the participating enterprises, it is recognized that the information may be subject to potential bias or inaccuracies, despite a reasonable level of trust in its reliability.

Furthermore, the constraints imposed by martial law hindered the ability to conduct comprehensive surveys encompassing the entire spectrum of e-business enterprises in Ukraine. The sample comprised entities that voluntarily chose to participate, which limits the generalizability of the findings. As such, it is not possible to assert that the sample's structure fully represents the diversity and overall composition of the Ukrainian e-business landscape. Since the performance indicators used in the study are applicable to business across all sectors of the economy, we believe that any potential discrepancies between the sample data and the structure of e-business enterprises in Ukraine did not significantly impact the results obtained.

CONCLUSION

This study sheds light on the key performance factors influencing the effectiveness of e-business enterprises in Ukraine, particularly those that fall within the scope of managerial influence. The findings underscore the significant role that management plays in shaping both financial and operational outcomes. Variations in income, profit, and profitability levels among surveyed enterprises point to differing efficiency levels and emphasize the need for tailored managerial approaches to enhance performance.

The analysis also reveals that many e-business enterprises opt for an organizational and legal structure that helps minimize tax liabilities – an approach that has been linked to higher profitability. However, legislative limitations on turnover and employee numbers under such legal forms may eventually compel enterprises to transition to alternative structures, potentially reducing their profitability.

Moreover, a strong correlation between turnover and workforce size suggests that business growth will likely lead to organizational restructuring. This transition may affect profitability, reinforcing the need for strategic foresight in management decisions.

Overall, the results highlight the crucial impact of managerial actions on the operational success of e-business, particularly in the evolving digital economy. These insights offer a foundation for designing targeted management strategies aimed at optimizing resources, improving financial outcomes, and ensuring long-term competitiveness. Further research should expand the dataset and integrate additional performance metrics to build a more complete picture of the success factors for Ukrainian e-businesses undergoing digital transformation.

AUTHOR CONTRIBUTIONS

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