МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ДНІПРОВСЬКИЙ ДЕРЖАВНИЙ АГРАРНО-ЕКОНОМІЧНИЙ УНІВЕРСИТЕТ
ФАКУЛЬТЕТ МЕНЕДЖМЕНТУ І МАРКЕТИНГУ
КАФЕДРА МЕНЕДЖМЕНТУ І ПРАВА

ДОПУСТИТИ ДО ЗАХИСТУ
В ЕКЗАМЕНАЦІЙНІЙ КОМІСІЇ:

Завідувач кафедри,
д.е.н., проф.
_____Олександр ВЕЛИЧКО
«____» _____ 2023 р.

КВАЛІФІКАЦІЙНА РОБОТА

на тему: BUSINESS MODEL BASED MANAGEMENT IN ENTERPRISES

УПРАВЛІННЯ ПІДПРИЄМСТВАМИ НА ОСНОВІ БІЗНЕС МОДЕЛЕЙ

Освітньо-професійна програма «Менеджмент»
Спеціальність 073 «Менеджмент»
Ступінь вищої освіти: Бакалавр

Здобувач **Арсеній ВЕСНОВСЬКИЙ**

Науковий керівник,
к.е.н, доцент **Наталя ДУБРОВА**

Дніпро – 2023

ДНІПРОВСЬКИЙ ДЕРЖАВНИЙ АГРАРНО-ЕКОНОМІЧНИЙ УНІВЕРСИТЕТ
Факультет: Менеджменту і маркетингу
Кафедра: Менеджменту і права
Освітня-професійна програма: «Менеджмент»
Спеціальність: 073 «Менеджмент»
Ступінь вищої освіти: «Бакалавр»

З А Т В Е Р Д Ж У Ю
Завідувач кафедри,
д.е.н., проф.
_____ Олександр ВЕЛИЧКО
«____» _____ 202__ р.

З А В Д А Н Н Я

на підготовку кваліфікаційної роботи
ВЕСНОВСЬКОМУ АРСЕНІЮ ВСЕВОЛОДОВИЧУ

1. **Тема роботи:** "Управління підприємствами на основі бізнес моделей"
Науковий керівник: Дуброва Наталя Петрівна, к.е.н, доцент,
затверджені наказом ректора ДДАЕУ від "10" квітня 2023 р. №641
2**. Термін подання здобувачем роботи** – 05 червня 2023 року.
3**. Вихідні дані до роботи:** річні звіти товариства з обмеженою відповідальністю "Дніпровський завод будівельних матеріалів" за 2020-2022 рр., виробничо-фінансові плани, діючі схеми організаційної структури та структури управління, основні економічні показники фінансово-господарської діяльності, бухгалтерська та статистична звітність, літературні джерела за темою дослідження.
4. **Зміст розрахунково-пояснювальної записки (перелік питань які потрібно розкрити).**
1. Екосистеми платформ в бізнес-моделі підприємства. 2. Управління на основі бізнес-моделі в умовах товариства з обмеженою відповідальністю "ДЗБМ". 3. Створення вартості та роль даних у B2B платформах. 4. Висновки та пропозиції.
5. **Перелік графічного матеріалу (з точним зазначенням обов'язкових креслень)**.
1. Ключові відмінності між платформами B2B і B2C. 2. Показники ступеня та ефективності використання трудових ресурсів ТОВ "ДЗБМ". 3. Показники рівня забезпеченості підприємства виробничими потужностями. 4. Обсяг і витрати, пов'язані з виробництвом основних категорій продукції для ТОВ "ДЗБМ". 5. Основні показники діяльності ТОВ "ДКМЗ". 6. Фактори зовнішнього середовища, що впливають на діяльність ТОВ «ДЗБМ». 7. Аналіз основних покупців продукції ТОВ "ДЗБМ" (за спеціалізацією), %. 8. PEST аналіз ТОВ "ДКМЗ". 9. Внутрішні фактори ТОВ "ДЗБМ". 10. SWOT-матриця ТОВ "ДЗБМ". 11. Розрахунок рентабельності інвестиційного проекту впровадження автоматичної системи гідратації вапна "ВІК_56" на ТОВ "ДЗБМ".

6. **Консультанти розділів роботи**

Розділ	Прізвище, ініціали та посада консультанта	Підпис, дата	
		Завдання видав	Завдання прийняв

7. Дата видачі завдання: «17» вересня 2022 року

КАЛЕНДАРНИЙ ПЛАН

№ з/п	Назва етапів кваліфікаційної роботи	Термін виконання етапів роботи	Примітка
1.	Вибір і затвердження теми роботи, об'єкта дослідження	Вересень 2022 року	*виконано*
2.	Складання і затвердження розгорнутого плану та завдання на кваліфікаційну роботу	Вересень 2022 року	*виконано*
3.	Вибір і опрацювання джерел інформації щодо теоретичних аспектів організації менеджменту в аграрних підприємствах. Виконання першого теоретичного розділу "Екосистеми платформ в бізнес-моделі підприємства"	Вересень - листопад 2022 року	*виконано*
4.	Дослідження організаційно-економічної та управлінської діяльності підприємства. Виконання другого дослідницько-аналітичного розділу " Управління на основі бізнес-моделі в умовах товариства з обмеженою відповідальністю "ДЗБМ"	Грудень 2022 року – лютий 2023 року	*виконано*
5.	Розробка шляхів удосконалення організації менеджменту в підприємстві. Виконання третього проєктно-рекомендаційного розділу роботи "Створення вартості та роль даних у B2B платформах"	Березень - квітень 2023 року	*виконано*
6.	Розробка висновків та пропозицій	Травень 2023 року	*виконано*
7.	Оформлення тексту кваліфікаційної роботи, супровідних документів до неї.	Травень 2023 року	*виконано*
8.	Підготовка доповіді та ілюстративного матеріалу до захисту роботи	Травень 2023 року	*виконано*
9.	Перевірка тексту для встановлення рівня оригінальності роботи та відсутності академічного плагіату, фабрикації та фальсифікації	Червень 2023 року	*виконано*
10.	Представлення роботи на засідання кафедри	Червень 2023 року	*виконано*
11.	Захист кваліфікаційної роботи	Червень 2023 року	

Здобувач _____ Арсеній ВЕСНОВСЬКИЙ

Керівник роботи _____ Наталя ДУБРОВА

DNIPRO STATE AGRARIAN AND ECONOMIC UNIVERSITY

Faculty of Management and Marketing
Department of Management and Law
Educational and professional program: "Management"
Specialty: 073 "Management"
Degree of higher education: "Bachelor"

APPROVED:
Head of Department,
Doctor of Economics,
Prof._____ Oleksandr VELICHKO
«____» _____ 202__ .

A S S I G N M E N T

for the preparation of qualification work
VESNOVSKYI ARSENII

1. The topic of the work: "Business Model Based Management in enterprises"
Supervisor: Dubrova Natalia, PhD, Associate Professor
approved by the order of the rector of DDAEU from «10» April 2023. № 641.
2. The deadline for submission by the paper is June 5, 2023
3. Input data for the work: annual reports of the limited liability company Dneprovskiy construction materials plant (LLC "DCMP") for 2020-2022, production and financial plans, current schemes of the organizational structure and management structure, the main economic indicators of financial and economic activity, accounting and statistical reporting, literary sources on the research topic.
4. Content of the settlement and explanatory note (list of issues to be disclosed). 1. Platform ecosystems in business modes of enterprise. 2. Business model based management in conditions of limited liability company "DCMP". 3. Value creation and the role of data in B2B platforms. 4. Conclusion and proposals.
5. **A list of graphic material (with a precise indication of mandatory drawings).**
1. Key differences between B2B and B2C platforms. 2. Indicators of the degree and effectiveness of the utilization of labor resources of LLC "DCMP". 3. Indicators of the level of provision of the enterprise with production facilities. 4. Quantity and costs associated with producing the primary product categories for LLC "DCMP". 5. Main performance indicators of LLC "DCMP". 6. Factors of the external environment affecting the activity of LLC "DCMP". 7. Analysis of the main buyers of products of LLC "DCMP" (by specialization), %. 8. PEST analysis of LLC "DCMP". 9. Internal factors of LLC "DCMP". 10. SWOT matrix of LLC "DCMP". 11. Calculation of the investment project profitability for the introduction of the automatic system of lime hydration "VIK_56" at LLC "DCMP".

Consultants of work sections

Section	Surname, initials and position of the consultant	Signature, date	
		Issued the task	Accepted the task

1. **Date of assignment**: 17.09.2022

TIME SCHEDULE

N	The name of the qualification work stages	The term of work stages performance	Note
1.	Selection and approval of the work topic, research object	September 2022	*done*
2.	Compilation and approval of a detailed plan and task for qualification work	September 2022	*done*
3.	Selection and processing of sources of information regarding theoretical aspects of management organization in agricultural enterprises. Implementation of the first theoretical section "Platform ecosystems in business modes of enterprise"	September-November 2022	*done*
4.	Research of organizational, economic and managerial activities of the enterprise. Implementation of the second research and analytical section "Business model-based management in conditions of limited liability company "DCMP"	December 2022–February 2023	*done*
5.	Development of ways to improve the organization of management in the enterprise. Implementation of the third project-recommendation section of the work "Value creation and the role of data in B2B platforms"	March - April 2023	*done*
6.	Development of conclusions and proposals	May 2023	*done*
7.	Completion of the text of the qualification work, accompanying documents to it	May 2023	*done*
8.	Preparation of the report and illustrative material for the defense of the work	May 2023	*done*
9.	Checking the text to establish the level of originality of the work and the absence of academic plagiarism, fabrication and falsification	June 2023	*done*
10.	Presentation of the work at the meeting of the department	June 2023	*done*
11.	Defense of the qualification work	June 2023	

Applicant _____ Arsenii VESNOVSKYI

Supervisor _____ Natalia DUBROVA

CONTENT

INTRODUCTION

Digital platforms, like Google, Apple, or Amazon, which connect consumers with providers of offers on one side and suppliers of offers on the other, are among the most profitable and rapidly expanding businesses in the world (Cusumano, Yoffie, & Gawer, 2020). With the aid of the interface providers, platform owners enable transactions between them, creating what is known as a platform ecosystem (Van Alstyne, Parker, & Choudary, 2016).

Because of this, the platform business model previously mentioned depends less on internal value chain optimization and more on the coordination of an external ecosystem of actors and their assets (Parker, Van Alstyne, & Choudary, 2016).

Significant research has been done in the field of information systems to examine the causes and conditions that led to the success of this business model in comparison to the traditional industrial giants (Parker et al., 2016). However, a large number of related papers addressed the subject of platforms more generally, concentrating mostly on how value is created in the business-to-consumer (B2C) sector, where well-known examples like Uber and Airbnb originate from (Drewel, Zcan, Koldewey, & Gausemeier, 2020).

The literature on these industrial platforms and their ecosystems, where both producers and consumers are companies, remains under-researched even as more and more industrial digital platforms (e.g., Adamos, Axoom, MindSphere) emerge and such B2C giants as Amazon, Google, and Facebook are shifting to business-to-business (B2B) markets. The distinctions between consumer and industrial platforms are not emphasized in existing literature evaluations (e.g., Hasler, Schallmo, Hackl, & Lang, 2020). Moreover, even though the vast majority of the platforms in both B2C and B2B space are digital (de Reuver, Sørensen, & Basole, 2018), and some scholars (e.g., Riemensperger & Falk, 2020; Malthouse, Buoye, Line, El-Manstrly, Dogru, & Kandampully, 2019) acknowledge the highest

relevance of data for industrial platforms' competitiveness, the research on the conceptual role of data in the value (co)-creation process in such platforms is even more limited.

The purpose of this paper's research is to fill in any research gaps, lay the groundwork for future studies, and incorporate existing academic findings about the unique features of B2B platforms into a conceptual framework. This includes conceptualizing data and its function in the value-creation process in such business-to-business ecosystems.

Object of the research. The following research questions are the focus of this paper's analysis and synthesis of the existing body of knowledge: What key distinctions exist between B2B and B2C platforms? What function does data play conceptually in B2B platforms when it comes to value creation? Business models of companies operating on the fundamental B2B and B2C platforms are the topic of research.

Methodology. This essay adheres to the recommendations made in Webster and Watson's 2002 paper on drafting a literature review. To find relevant literature on B2B and B2C platforms and the function of data for value creation in them, a search for information was primarily undertaken using databases of peer-reviewed journals, conference proceedings, case studies, and textbooks. In addition, much like a substantial portion of platform literature, the study adopts a platform owner's perspective in order to draw broad managerial conclusions that will aid in understanding and improving existing B2B platforms and inspire the development of new ones. In order to demonstrate the unique characteristics of businesses and develop business models, financial data from the limited liability company “Dneprovskiy construction materials plant” was gathered.

CHAPTER 1
PLATFORM ECOSYSTEMS IN BUSINESS MODES OF ENTERPRISE

1.1. Platform and Platform Ecosystem Definitions in Business Models

Regarding the platform term's definition, there are several inconsistencies in the literature. “Business model that uses technology to connect people, organizations, and resources in an interactive ecosystem” (Parker et al., 2016, p. 2) is a widely used term that encompasses numerous other more detailed definitions.

Other definitions of this phrase include “multisided platform,” “digital platform,” “multifirm environment,” etc. Although each of these phrases has a distinct purpose, it is obvious. For instance, the term “digital platfor”" in corporate software literature more often refers to the technical foundation that enables add-ons to be developed by outside developers (de Reuver et al., 2018). Although the vast majority of platforms operate in the digital environment and rely on digital technology (such as ICT), this article uses the terms "digital platforms" and "platforms" interchangeably as synonyms. The platform connecting two or more groups of players and facilitating interactions between them is the key feature that ties all of these concepts together.

Platform owner, suppliers, producers, and users are the four primary organizations that make up the platform ecosystem, which is the collective name for all of the platform's users (Van Alstyne et al., 2016). Third-party developers who add-on applications to the platform owner's core application are known as complementors in the literature on digital platforms (de Reuver et al., 2018).

In the literature, there are various traits that are viewed as descriptive and particular to platform business models and associated ecosystems. They are detailed in more depth below since they are crucial to comprehending the platform phenomena.

The idea of network effects is the primary force behind the platforms' explosive expansion. Network effects suggest that the value of something, in our example, the value of the Foundational Literature 4 platform, for the growth of participants depends on the platform's user base. The ecosystem of phone users is a common example from the literature; since a single phone user cannot call anyone, the value of such a one-node network is zero, but as more users join the network, the value of this network increases for each user as more connections become feasible. This is an illustration of a positive network effect, but if the platform cannot preserve its quality and adjust to the exponential growth in user numbers, the value of the platform for each participant would decline as more users are added (Parker et al., 2016).

The platform's power comes from network effects, but it is not yet apparent how to begin this cycle of value expansion. If there are no users on the platform, providers will not be motivated to join, and vice versa. In the literature, this situation is known as a "chicken-or-egg problem" (Caillaud & Jullien, 2003). According to Parker et al. (2016), platforms can overcome this problem in a variety of ways, such as by initially subsidizing one side (such as users) and then relying on same- and cross-side network effects to draw in new users and producers.

Even if the platform is effectively launched, it might be difficult for the owner to keep it operational and of a high standard for all users. This is the point at which the phrase "platform governance" comes into play. "Governance is the set of rules that determine who is allowed to participate in an ecosystem, how value is distributed, and how conflicts are resolved" (Parker et al., 2016, p. 91). Therefore, the main concern with platform governance is the balance between openness and control. Platform governance simply establishes who and how interacts inside the platform ecosystem. On the one hand, the less room there is for third-party producers to innovate, the more control the platform owner exerts over the platform. On the other side, maintaining a high level of material quality becomes more difficult as the standards become less restrictive. There is no ideal balance

between openness and control, therefore each platform should eventually find it on its own.

In general, platforms are divided into transaction, innovation, and hybrid platforms based on the conventional taxonomy of value creation. According to Cusumano et al. (2020), these types differ in how they generate value: transaction platforms enable and facilitate transactions that would not take place without them, whereas innovation platforms generate value by assisting third-party innovation activities like app development. In order to facilitate both the development of certain novel value units by producers and the exchange of these value units for payment from the user side, hybrid platforms include infrastructure and governance mechanisms (such as Google's PlayStore for Android app users). However, there are other sub-categories relating value generation strategies for each of these platform kinds, depending on the particular industry, for example.

Although the platform literature emphasizes the necessity of data for the platforms, it does not properly define the term. According to Bhargava, Rubel, Altman, Arora, Boehnke, Daniels, Derdenger, Kirschner, LaFramboise, Loupos, Parker, and Pattabhiramaiah (2020), the platform's players' activities are coordinated using data throughout the entire value creation process. This theory is supported by B2B platform literature, which also states that for platforms with manufacturing company users, "key competitiveness will rely on the data-driven operation of the physical world" (Riemensperger & Falk, 2020, p.61). In this thesis, "data" refers to any information that is directly collected, processed, or stored on a platform or by applications that are introduced to it (such as in the case of corporate software platforms).

This study then moved on to the search for more specialized publications with a focus on the B2B platforms, the value-creation process within them, and the significance of data for this process and platforms in general after going through the broad platform literature. Consequently, the following key phrases were combined: Platform Economy, Platform Ecosystem, and Platform Owner are some terms used to describe B2B platforms.

The following databases were used for the search: UBMannheim, AIS eLibrary, and Google Scholar. Since the majority of the publications are connected together (e.g., from Google Scholar to UBMannheim, to AIS eLibrary), the search was initiated there because it has the most research papers available. But also suggests that both high- and low-quality papers will be there, and that getting relevant publications of good enough quality will need a lot of work.

Additionally, many successful B2B platform examples in literature, such as MindSphere, Axoom, or Adamos, are platforms for industrial Internet of Things (iIoT) applications. As a result, the term iIoT was included along with other keywords, and case studies that explained or used the success of these companies were also sought after.

The following inclusion/exclusion standards were applied, given in order of importance:

1) Fit of research question: The connection to the thesis's research topics served as the primary inclusion criterion. The abstract and selected passages from the whole article were read in order to evaluate it for a particular paper. Additionally, key words from the article were looked up to see if there was any useful data for the study. This is because a specific topic, such as the distinctions between B2B and B2C platforms or the role of data in the value creation process, is not directly addressed in the research that has already been done. This means that there is a low likelihood that the necessary information will be included in the title or abstract.

2) Source quality: This study primarily focuses on high-caliber literature, which preferably entails articles and conference proceedings from peer-reviewed journals with ratings of B/A/A+ (according to the VHB scale). However, it was also included in the thesis' scope if the paper was thought to be extremely important but only received a C or no grade at all.

3) Publication date: Because the subject is so new, we only included works that were published before 2010.

Even after filtering, there are still tens of thousands of search results on Google Scholar, making it impossible to apply quality and fit standards to every one of them. However, relevancy is used to order these results. As a result, the first five pages of each search phase, which amount to around fifty articles, were scrutinized. It became apparent throughout the procedure that there were almost no relevant research past page 4 of the search results. The backward and forward search was then carried out following more searching in the basket of eight in the AIS eLibrary. Additional articles were found as a result. Appendix A and Appendix B, respectively, contain information about the search and the concept matrix.

First, all of the publications reviewed can be split into two categories based on the market that their primary platforms operate in: broad (exploring the platform business model phenomenon in a general context, but with a preponderance of instances and concepts from B2C) and specifically B2B-oriented. The latter part can be sub-divided into three main streams dependent on the industry context, namely enterprise software platforms (e.g., Ceccagnoli, Forman, Huang, & Wu, 2012; Sarker, Sarker, Sahaym, & Bjørn-Andersen, 2012; Schreieck, Wiesche, & Krcmar, 2017), industrial Internet of Things platforms (e.g., Hodapp, Hawlitschek, & Kramer, 2019; Hein, Weking, Schreieck, Wiesche, Böhm, & Krcmar, 2019), and business-to-business e-marketplace (Li & Pénard, 2014; Mazur, 2020). In addition, a few studies (Richter & Slowinski, 2018, Otto & Jarke, 2019) examine data exchange platforms, one focuses on the example of a healthcare platform (Gleiss et al., 2021), and some papers are industry-neutral (e.g., Grover & Kohli, 2012).

Only Pauli, Fielt, and Matzner (2021) focused on specifically examining the differences between B2B and B2C space among the latter class of industry-neutral articles. The majority of papers, however, simply briefly identify distinguishing features, frequently in very narrow contexts and without going into more depth. For instance, Förderer, Kude, Schuetz, and Heinzl (2018) remark that B2B solutions like ERP systems are technologically sophisticated and offer

functionality for numerous business lines at once, emphasizing on knowledge boundaries in the context of enterprise software platform development. As a result, industrial goods, services, and ecosystems are more complicated and heterogeneous than their B2C equivalents. As several B2B marketplaces in 2000 shown, failing to merely adopt consumer solutions to the industrial sector may result in failures (Pidun, Reeves, & Schüssler, 2020). These enterprises were unaware that the issue of high transaction costs, which was addressed by B2C marketplaces, did not exist in the B2B sector, where businesses had close relationships with their supply chains (Pidun et al., 2020).

Following a thorough analysis of the pertinent papers, four characteristics of platforms were found to best represent the key distinctions between business-to-business and business-to-consumer platforms and their ecosystems: product, ecosystem size, actor heterogeneity, and network effect power. The viewpoints given by the literature on each of these attributes are addressed below. The synopsis is shown in Table 1.1.

Table 1.1

Key differences between B2B and B2C platforms

	B2B	B2C
Product	The product is niche, technically complex, and is used in the critical business processes of the buyer company to create value.	The product is mass-market oriented; it is rather simple and designed to fit most customers.
Heterogeneity of actors	There are more groups of actors that are diverse even within their particular group.	The set of actors is limited and simple.
Size of the ecosystem	Although the participants in the ecosystem are diverse, the overall number of them is significantly smaller for one platform than in B2C.	The ecosystem is large, consisting of millions of atomistic homogeneous actors on the user side.
Power of network	Due to the	Network effects are

effects	aforementioned fact, the scaling of the platform is slower and limited.	strong, and a lot of fast winner-takes-all cases are known.

While the consumer sector strives for general solutions to appeal to a wider audience of mostly homogeneous consumers, the literature describes the goods and services offered and traded on business-to-business platforms as unique and specific (e.g., Falk & Riemensperger, 2019). For instance, each Uber user receives exactly the same service, but industrial IoT apps are frequently created as a vertically-specific solution to meet the needs of certain businesses (Russo & Albert 2018). Another example is seen in B2B application platforms, which, according to Buchinger, Spek, Ranaivoson, and Lindmark (2014) in their work where they study the typology for such platforms, are primarily focused on a single industry or business process.

The technical complexity that business-to-business space assumes complements and narrows even further the narrow emphasis of industrial goods and services. For instance, IT systems in the B2B sector are described as being increasingly varied and complicated by Schreieck et al. (2017). In the context of the Internet of Things, where "[...] the platform owner must provide device management, compatibility with sensors and machines, and communication protocols to the demand of industrial customers," this phenomena is exemplified effectively. (Hein et al., 2019), page 504.

Furthermore, compared to the B2C market, the role that these items perform for the user is significantly more significant. Industrial goods and services are a crucial part of both the user's value chain and important business activities (Hein et al., 2019; Marcos-Cuevas, Nätti, Palo, & Baumann, 2016). As a result, the success of the business as a whole depends on the solution's quality, especially in the eyes of its clients (Schreieck et al., 2017). For instance, a person receiving subpar apparel or a computer from Amazon has a less impact on society than a business running out of supplies and having to halt operations as a result of a poorly thought-through ERP solution. Additionally, given the importance of these

business operations, platform-based industrial solutions should offer much greater levels of data security because doing so puts organizations' reputations and advantages in the market at risk (Pauli et al., 2021).

1.2. Heterogeneity of Actors in Business Models

From one perspective, the product's features in the business-to-business context discussed above are a consequence; but, from a different perspective, they are the cause of the next B2B difference from consumer-oriented platforms, which is the diversity of ecosystem participants.

On the one hand, the businesses, even those in the same industry, differ greatly from one another in terms of their operations, resources, capacities, clientele, etc. (Schreieck et al., 2017). It may be argued that consumers' tastes and preferences vary widely as well. That is accurate, however in this case the scale is crucial. While meeting the unique needs of just one customer may not make much sense, the platform may benefit from investing in tailored solutions for the business that has a much larger budget than an individual (Buchinger et al., 2014). Because of this, the B2B market has a wide range of specialized products and platforms. Additionally, systems that are quite general may require an integration expenditure to guarantee the platform's compliance with the diverse users initially (Tan, Anderson Jr., & Parker, 2020).

As a result, the platform's value for these disparate parties is also diverse. For instance, if an independent software vendor (ISV) joins an enterprise software platform as a supplier, their benefits will be greater if they have stronger downstream capabilities (such as in sales and marketing) (Ceccagnoli et al., 2012). When creating the platform, the owner should take that into account.

However, in order to generate goods and services that are so technically complex, platforms cannot solely rely on third-party developers to add value; instead, they must promote the involvement of a variety of heterogeneous actors (Hein et al., 2019; Pauli et al., 2021).

The ecosystem of the iIoT platform, which includes, among others, sensor makers, machine tool businesses, and component vendors, is exemplified by Petrik and Herzwurm (2019). In their investigation of the 365FarmNet scenario, Endres, Indulska, Ghosh, Baiyere, and Broser (2019) examine an iIoT platform for agriculture. In addition to the previously mentioned third-party developers, this platform links farmers who are using the solution with businesses in various sectors, such as Bayer, a chemical company, "[...] which provides information about the agricultural weather and gives advices about when which plant protection products should be used" (Endres et al., 2019, p. 12).

An illustration from data platforms by Russo & Albert (2018) shows how B2B ecosystem actors may represent various links in the value chain. As a result, these ecosystems enable the development of comprehensive vertical solutions because different actors' specialized domain knowledge is shared. Drewel et al.'s (2020) final visualization of the variety of ecosystem actors from the AI-Marketplace platform may be found in Appendix C. The shared B2C platform ecosystem is greatly expanded by all the participants, including AI experts, AI integrators, consultants, and suppliers of AI components that are then incorporated into application solutions.

B2C-focused magazines frequently cite well-known brands like Uber, Airbnb, and Google's Android among the platform businesses they highlight as successful instances of the platform business model. According to Schreieck et al. (2017), the end-user base of such a consumer-focused IT platform is much larger than that of their B2B counterparts. That could be the result of the complicated products and heterogeneous consumer bases, even within the same business, as indicated in the preceding sentences. Furthermore, logical reasoning shows that there are unquestionably fewer businesses than end users. As a result, business-to-

business platforms are not anticipated to exhibit the same winner-takes-all effects and high degree of consolidation as the B2C industry (Russo & Albert, 2018). According to Petri & Herzwurm, 2019; Schermuly, Schreieck, Wiesche, & Krcmar, 2019; Pauli, Marx, & Matzner, 2020; there are more platforms in the B2B arena, but fewer ecosystem actors.

It is important to note that distinct B2B platforms from various industries have their own unique characteristics. While the enterprise software market is highly consolidated, with a few big companies, such as Oracle, Salesforce, Microsoft, and SAP, dominating the market (Gerrikagoitia, Unamuno, Urkia, & Serna, 2019), there are many medium-sized iIoT platforms competing with one another. This might be the consequence of the control that ERP platforms exercise over the assets by providing platform core (Ceccagnoli et al., 2012; Sarker et al., 2012; Hein, Schreieck, Riasanow, Setzke, Wiesche, Böhm, & Krcmar, 2020), or mostly in-house development (Buchinger et al., 2014), what is rather untypical for the consumer platform business models presented in the literature, which almost solely focus on the external assets' orchestration (Parker et al., 2016).

The platform business model is based on the idea of network effects. This idea explains "the impact that the number of users of a platform has on the value created for each user" (Parker et al., 2016, p. In this way, platforms can grow quickly because existing users draw in additional users, who in turn draw in more users. Winner-take-all effects are made possible by strong network effects. As a result, the platforms that are able to surpass rivals in terms of audience growth will be more valuable to any new users and so rule the market (Parker et al., 2016).

Despite the fact that this phenomena is crucial to the platform business model, there isn't much research on network effects in the B2B sector, and the publications that do don't really concentrate on how it differs from the B2C sector. For instance, Li and Pénard (2014) only mention the importance of the quantity of suppliers in the early stages of the B2B marketplace and the importance of the quality of providers in the later stages.

However, it appears that the majority of publications (Schreieck et al., 2017; Wallbach, Coleman, Elbert, & Benlian, 2019; Falk & Riemensperger, 2019; Pauli et al., 2020) agree that existing B2C findings in this field cannot be simply transferred to the industrial space. Several publications also discuss potential causes of this. For instance, according to Schreieck et al. (2017), network effects are hampered by the excessively complicated architectures of B2B platforms, making it impossible to apply consumer-oriented research's findings. This argument is supported by Falk and Riemensperger (2019), who also note that the industrial product's niche nature, along with the intricacy already noted, prohibits the winner-take-all supremacy typical of many B2C situations.

The broad platform literature could also yield the same results. According to Parker et al. (2016), "a market with little or no niche specialization is particularly susceptible to the winner-take-all effect" (Parker et al. 2016, p. 129). Because vertical-specific end-to-end solutions developed for one user are of limited value to other clients, it follows that a single player will not likely dominate the B2B industry (Schermuly et al., 2019). In addition, Parker et al. (2016) contend that a frictionless entry—the potential for quick and simple joining of new platform users—is one of the reasons behind network effects and the rapid growth of the platform. It makes sense to presume that because of the heterogeneity of players, their procedures, capabilities, and assets even within one industry, B2B platforms are less frictionless for users to enter. Platforms find it more challenging to guarantee their platform's technological compatibility with every type of business that might use it.

The organizational complexity of the players and the significance of the products and services bought on the platform for their business processes make the entire process of joining the platform even more challenging.[…] Although users rarely read the entirety of a platform's terms of service agreement, businesses considering joining must be aware of the repercussions of relying on it. Despite the potential gains in efficiency, platforms in B-to-B value chains are likely to take longer to gain traction. 2019: p. 875 in Kenney, Rouvinen, Seppälä, & Zysman.

Due to the fact that companies' competitive advantage depends on data security and overall product quality, the entire purchasing process is not as simple and quick as in the B2C space (Falk & Riemensperger, 2019; Bhargava et al., 2020; Pauli et al., 2021).

One of the iIoT platform's complementors puts this point into practical perspective when they say, "We are quite critical of the current development of selling apps via a platform in the B2B sector because there is a huge difference from the B2C sector where a private customer is open to click & buy an application on the store. More consultancy is required in the B2B space. A normal client won't just purchase an industrial application from the store without consulting someone first. p. 9; Pauli et al., 2020). In addition to the above-mentioned slow dynamics of network effects, Petrik and Herzwurm (2019) point out that the modest size of ecosystems prevents the scale of expansion that B2C platforms like Uber or Airbnb demonstrate in terms of potential customers.

However, due to stronger than B2C lock-in effects and higher switching costs, which are also brought on by the high degree of complexity and customization of the products and services, all the participants the platform manages to acquire are more likely to stay with the same platform for a long time (Schermuly et al., 2019).

CHAPTER 2
BUSINESS MODEL BASED MANAGEMENT IN CONDITIONS OF LIMITED LIABILITY COMPANY “DCMP”

2.1. Organizational and Financial Characteristics of the Activity of Limited Liability Company “DCMP”

One of the biggest producers of construction materials in Ukraine since 1959 is the Limited Liability Company " Dneprovskiy construction materials plant ".

Production of quicklime is one of LLC “DCMP”'s main focuses.

- production of ready-to-use concrete solutions;
- production of plasterboard mixtures;
- production of bricks, tiles, and other terracotta construction materials.

The business is authorized to engage in any other activity that is not restricted by Ukrainian law at the moment.

Bricks made by LLC "DCMB" are used to construct the majority of the city of Dnipro's structures, buildings, and residential areas. According to the company's specialists, more than 7 billion bricks, enough to construct more than 50,000 apartment buildings, have been made since its beginning.

The facility is currently one of Ukraine's leading producers of face and regular silicate bricks, lump and slaked lime, silicate mass, and aerated concrete following rebuilding. The company has a production capacity of 110 million conventional brick units, 38 thousand cubic meters of aerated concrete, and 60 thousand tons of lime annually.

Even the most discerning consumers will be satisfied with the company's vast selection of items, high quality, and consistent delivery, assuring maximum profitability and close working relationships.

The largest Ukrainian mining, metallurgical, and construction companies, including PJSC "Dniprovsky Metallurgical Plant", PJSC "Ternopilskyi Karier",

PJSC "Evraz Dniprovsky Metallurgical Plant", PJSC "Interpipe NTZ", SE "Eastern Mining enrichment plant," and "Budivevelnik-P" ChSMP, are long-term partners of the combine.

We shall examine the indications of the extent and effectiveness of the enterprise's utilization of labor resources (Table 2.1).

Table 2.1

Indicators of the degree and effectiveness of the utilization of labor resources of LLC "DCMP"

Indicator	2020	2021	2022	Change 2022 vs. 2020	
				absolute	relative, %
Number of employees, persons.	206	203	173	-33	-16,02
The company's working time fund, man-hours.	350596	348109	265420	-85176,0	-24,29
Total salary fund, thousand UAH	21915	23482,0	16082	-5833,0	-26,62
Income from sale on: one employee, thousand UAH	793,7	869,4	897,7	104,0	13,11
one man-hour worked, UAH	466,3	507,0	585,1	118,8	25,47
Profit output on: one employee, thousand UAH	15,6	18,9	32,9	17,3	111,30
one man-hour worked, UAH	9,1	11,0	21,4	12,3	134,39
Average monthly salary of 1 employee, UAH	8865,3	9639,6	7746,6	-1118,7	-12,62
Labor payment for 1 man-hour worked, UAH/man-hour.	62,5	67,5	60,6	-1,9	-3,07

In the years 2020 to 2022, the company's workforce shrunk by 33 persons (-16.02%). The war in Ukraine will result in lower production volumes, which will lead to a considerable fall in the number of employees in 2022.

In addition, the number of hours that LLC "DCMP" employees worked per week reduced by 24.26%, which translates to a shorter workday for one employee. As a result, the enterprise's average monthly wage decreased by 12.62% as a result of the shorter working hours and lower production volumes.

Since the enterprise's rate of staff reduction outpaces its rate of decline in production volumes, LLC "DCMP" has seen a gain in labor productivity of 13.1% per employee.

In addition to personnel resources, LLC "DCMP" manufactures items using pre-existing technological equipment, buildings, and lines. The main means of production are fully distributed throughout the workforce of the organization to ensure their efficient usage, which raises labor productivity, raises product quality, and raises overall workforce productivity. Indicators of the enterprise's level of provision with current assets and fixed assets are provided in the table 2.2.

Table 2.2

Indicators of the level of provision of the enterprise with production facilities

Indicator	2020	2021	2022	Change 2022 vs. 2020	
				absolute	relative, %
Average annual cost of fixed assets, thousand UAH	135479	137071	141716	6237	4,60
Average annual value of current assets, thousand UAH	68817	73066	79542	10725	15,58
Funding capacity of 1 employee, thousand UAH/person	657,7	675,2	819,2	161,5	24,56
Fund return per UAH 1 of fixed assets, UAH/UAH	1,207	1,288	1,096	-0,1	-9,19
Capital capacity 1 hryvnia of gross income, UAH/UAH	0,829	0,777	0,913	0,1	10,12
Turnover of current assets, ratio	2,38	2,42	1,95	-0,4	-17,82
Duration of 1 turnover of current assets, days	154	151	187	33,3	21,68
Current assets account for 1 hryvnia of fixed assets, UAH/UAH	0,508	0,533	0,561	0,1	10,50
Rate of return, %	3,14	3,65	5,14	2,00 в.п.	x

For the years 2020 to 2022, the indications in Table 2.2 point to a minor growth in the value of fixed assets. This indicator increased by 4.60 percent (+ UAH 6,237 thousand), which can be attributed to the revaluation of fixed assets. The value of working capital increased concurrently by 15.58%, which is related to an improvement in the balance between raw materials and completed goods. The considerable decline in income from production can be used to explain the fall in return on investment of 9.19% and the decrease in capital turnover of 17.82%. Because of the decline in turnover, the turnover period lengthened by 33 days, indicating a less effective use of the company's working capital.

Increasing manufacturing capacity and creating new product categories are

among LLC "DCMP"'s future ambitions. The LLC "DCMP" has a research and development philosophy that prioritizes technological advancements, important innovations that boost productivity, the creation of competitive products, etc.

The indicators are listed in the table 2.3. characterize the composition and structure of the company's product offering.

Table 2.3

Quantity and costs associated with producing the primary product categories for LLC "DCMP"

Indicator	2020		2021		2022		Deviation 2022 from 2020	
	unit	thousand UAH	unit	thousand UAH	unit	thousand UAH.	unit	thousand UAH
Lumpy lime, thousand tons	39,7	104346	32,5	115657	25,87	92598	-13,83	-11748
Silicate brick, million pcs. conventional units	17,2	57987	11,4	59542	8,05	61587	-9,15	3600
Aerated concrete blocks, million pcs. conventional units	1,3	1164	0,9	1284	0,6	1118	-0,7	-46
РАЗОМ	X	163496	X	176483	X	155303	X	-8193

The enterprise's overall output volume declined by UAH 8,193,000. In 2022, a decline is seen, and the war in Ukraine is to blame. After a full-scale conflict broke out in the beginning of 2022, production was suspended from March to June, which led to a decline in production quantities. Particularly, the production of lime fell by 13.83 thousand UAH, causing a loss of 11,748 thousand UAH.

The revenue from its sale increased by UAH 3.6 million as a result of the increase in silicate brick's pricing. Therefore, as construction in the area slowed as a result of the conflict, the need for building materials also reduced. Let's look at the primary measures of LLC "DCMP" activities in Table 2.4.

Table 2.4

Main performance indicators of LLC "DCMP"

Indicator	2020	2021	2022	Deviation of the 2022 level from 2020	
				absolute	relative, %
Net income, thousand UAH.	163496	176483	155303	-8193	-5,01
Current production costs, thousand UAH:	160290	172650	149614	-10676	-6,66
including production cost	150684	163082	140241	-10443	-6,93
selling expenses	2549	3105	2578	29	1,14
administrative expenses	4589	5627	5219	630	13,73
other operating expenses	2468	836	1576	-892	-36,14
Net profit (loss), thousand UAH.	3206	3833	5689	2483	77,45
The average registered number of employees, persons	206	203	173	-33	-16,02
Labor compensation fund, thousand UAH.	21915	23482	16082	-5833	-26,62
Labor productivity of 1 average employee, thousand UAH/person	793,67	869,37	897,71	104,04	13,11
Average annual salary of 1 average accounting employee, thousand UAH /person	106,38	115,67	92,96	-13,42	-12,62
Average annual cost of fixed assets, thousand UAH.	135479	137071	141716	6237	4,60
Funding of 1 average accounting employee, thousand UAH 1/person	657,7	675,2	819,2	161,5	24,56
Fund return of net income for 1 UAH cost of fixed assets, UAH / UAH	1,21	1,29	1,10	-0,11	-9,19
Return on assets, %	3,14	3,65	5,14	2,00 p.p.	x
Profitability of activity, %	2,00	2,22	3,80	1,80 p.p.	x

According to the data in this table, LLC "DCMP"'s sales volume declined by 5.01% between 2022 and 2020. Falling production is related to declining revenues. The profitability of assets and activities increased by 2.00 and 1.80 percentage points, respectively, as a result of a drop in expenses of 6.66% and an increase in net profit (+77.45%).

It is advised that the investigated enterprise be elevated to a higher level of management by partially modernizing and updating its fixed assets and partially diversifying its production to meet the demands of the construction market in order to increase the profitability of the business.

The company needs to expand into previously untapped market segments in

order to serve the building materials industry. It also needs to conduct market research on the key product categories, optimize management and production costs, assess the viability of outsourcing some auxiliary production tasks to third parties, and improve business procedures.

2.2. An Evaluation of the Enterprise's Business Model and Organizational Structure

We can better comprehend how society's resources are created and distributed by studying the environment of the corporation. Since the firm's operations would be impossible without the provision of resources, and since the resources utilized by the company have a sufficiently high cost (gas, coal, power, construction materials), it is obvious that this information is of utmost relevance for LLC "DCMP".

It is advised to consider the following factors when assessing how the enterprise's economic environment is affecting it: the economy's current state and economic processes (particularly the effects of inflation and deflation); the tax system and economic legislation; the degree of state support; general market conditions; the size and rate of change in market size; the size and growth rates of market segments that correspond to LLC "DCMP" interests; and investments.

The internal and external environments have always shaped how businesses operate. The commercial entities, economic conditions, social factors, and environmental factors functioning in the global environment make up the external environment. Figure 2.1 depicts the elements that make up LLC "DCMP's" exterior environment.

The external environment is separated into macro and micro depending on how different things influence it. The macro environment is made up of social connections, material, technical, and economic conditions, as well as other elements that have an indirect impact on business activities.

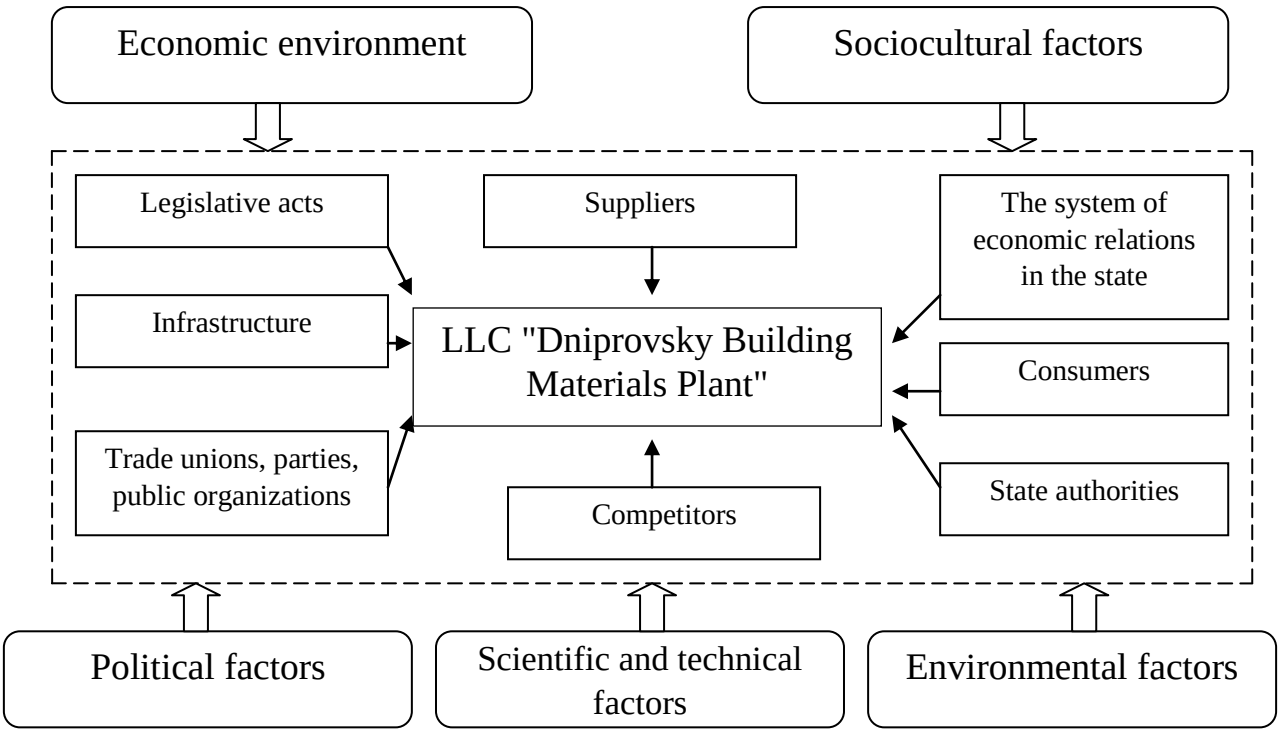

Figure. 2.1. Factors of the external environment affecting the activity of LLC "DCMP"

These include demographic, economic, political, and other variables that are ever-changing and necessitate ongoing adaptation on the part of the business. An environment that directly impacts a firm is known as a microenvironment. This includes vendors, middlemen, rival businesses, customers, etc.

The forces of a significant social endeavor that have an impact on the organization as a whole and its internal environment serve as a representation of the external environment. Demographic, economic, environmental, technical, political, and cultural variables all contribute to these dynamics.

Particularly, because they determine the customer, partners, rivals, etc., demographic considerations have a substantial impact on business activities. The analysis of the primary consumers of LLC "Factors of the external environment affecting the activity of LLC "DCMP" products by age is shown in Figure 2.2.

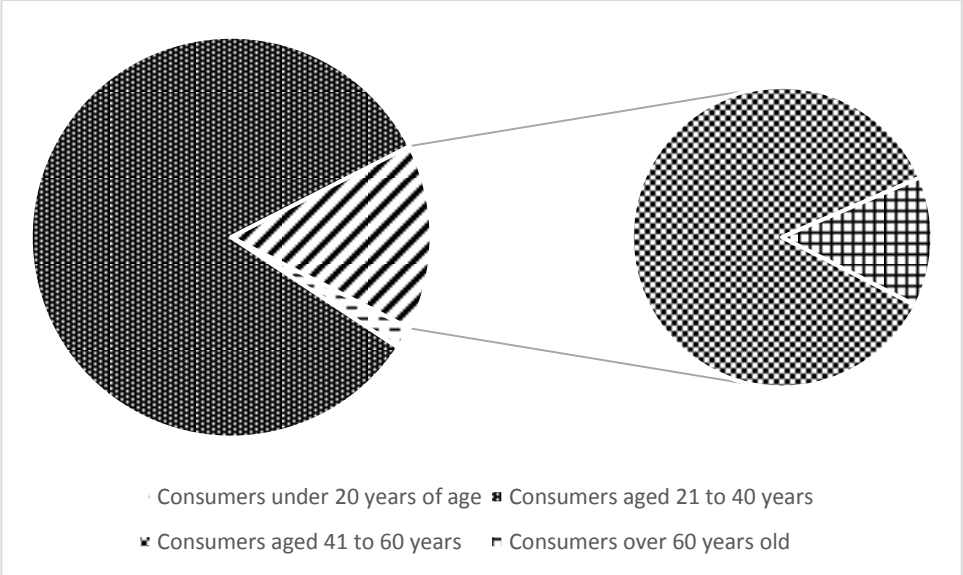

Fig. 2.2. Analysis of the main buyers of products of LLC "DCMP" (by age), %

The graph demonstrates that consumers between the ages of 21 and 40 make up the majority of LLC "DCMP" customers. And this is understandable given that the company's product line consists primarily of items utilized in industrial manufacturing. In the realm of production, particularly in the area of structural transformations, the findings of the research of demographic factors and the social environment must also be taken into consideration.

The social environment has an impact on how customer preferences are formed, which in turn determines the direction and size of consumer demand and, consequently, the firm's capacity to sell its goods. Due to the fact that LLC "DCMP”"s products are mostly used by businesses, we shall divide our customer base into groups based on how they produce (Fig. 2.3).

According to the indicated data, industrial and agricultural firms make up the highest proportion of LLC "DCMP" customers (56.7 and 21.4%, respectively).

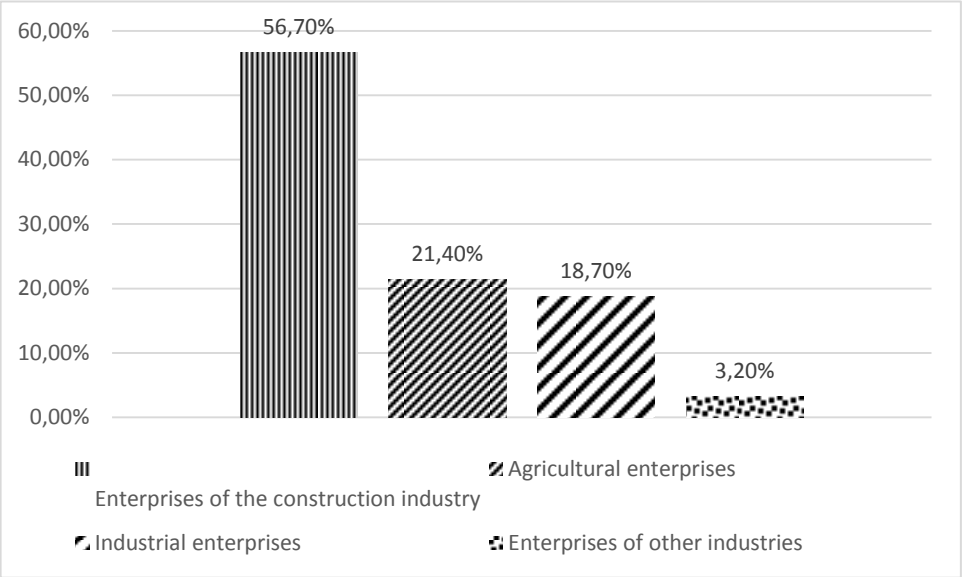

Fig. 2.3. Analysis of the main buyers of products of LLC "DCMP" (by specialization), %

The number of potential customers in the area; the availability and potential number of employees; and their professional features must all be considered while studying the demographic aspects and social environment of LLC "DCMP".

The sociocultural environment, which encompasses the societal norms and customs in connection to particular product categories, is the most crucial element of the social environment. These elements have an impact on customer motivation, making their study crucial for strategic management. Additionally, studying the economy helps us comprehend how society's resources are created and allocated. Obviously, LLC "DCMP" has to know this information because its operations depend on the utilization of resources, particularly energy.

The stock market and investments are underdeveloped, there is no established legal framework for innovation and investment activities, and tax law is inconsistent and unstable, among other major destabilizing elements.

Unfortunately, economic variables affect LLC "DCMP" activities in both positive and bad ways. The size and rate of market size changes, the sizes and

growth rates of market segments that are relevant to the organization, and the investment process all have a beneficial impact.

The amount of general economic development, the quality of the economic legislation, and the level of development of competitive interactions have the biggest detrimental effects.

The overall trend of the advancement of construction material production technology in Ukraine demonstrates the impact of scientific and technological variables on the management of marketing operations of LLC "DCMP". Because of the high level of industrial mechanization and automation, the scientific and technological environment also has an impact on how effectively LLC "DCMP" operates. It should be mentioned that requirements for staff credentials and the emergence of "technological breakthroughs" are among the elements that have the biggest positive effects. Thus, a PEST analysis matrix, represented in Table 2.5, may be constructed using the information provided.

Table 2.5

PEST analysis of LLC “DCMP”

Political factors	**Economic factors**
War in the country Uncertainty of legislative regulation State support of the construction industry. No restrictions on the import of products	Growing competition. Low level of innovation and investment support of the industry. Lack of qualified personnel High lending rate, exchange rate instability Shortage and high cost of energy resources
Social factors	**Technological factors**
Low solvency of the population. Change in consumer requirements for products. Lack of a clear emphasis on the quality characteristics of the product Low attractiveness of working professions in industry	High prices for new high-tech equipment. Weak business innovation activity. High level of wear and tear of the active part of fixed assets. Industrial goods are morally obsolete

The study demonstrates that, regrettably, the political and legal environment has a detrimental impact on the effectiveness of the company's work and greatly

increases the complexity of its operations. The assistance of domestic producers in conjunction with a certain degree of customs policy liberalization should be highlighted as one of the beneficial aspects.

Any organization must promptly respond to and adjust to environmental changes in times of economic turbulence. A strategic examination of the corporate environment helps with this. Therefore, doing a PEST study for LLC " PEST analysis of LLC “DCMP" as one of the methodologies, or strategic scanning of the environment, is thought to be pertinent. According to studies, LLC " PEST analysis of LLC “DCMP" is under a lot of threat, with the state's economy still in its infancy and the political climate being uncertain. In this sense, the company's flexibility and capacity to swiftly and appropriately adjust to the dynamic external environment are essential to its continued operation. After weighing the significance of the various variables, it is possible to conclude that none of them jeopardizes the company's stability, so long as sound strategic and operational choices are taken after careful consideration of the internal and external environments of the organization.

Table 2.6

Internal factors of LLC “DCMP”

Organizational and legal	
1. Form of ownership	Private
2. Form of organization	Limited liability company.
3. Organizational structure	Linear-functional
4. Personnel policy	Use of practical experience of employees.
5. Management style	Democratic leadership style
Resources	
1. Production capacity	The maximum capacity is not used, the enterprise is loaded at 60-70%
2. Raw materials and materials, components, etc	20% of raw materials and 40% of energy resources are imported from abroad
3. Financial	The company partially uses credit funds
4. Intellectual	The enterprise has its own development of scales, as well as technological development of production
5. Technological	Technologies are outdated.
6. Informational	The company has its own website and logo
7. Labor	Lack of qualified personnel.

The internal environment of LLC "DCMP " is the next component of the analysis of factors influencing the management of marketing activities. The table gives an overview of the traits of the internal corporate factors for LLC "DCMP". 2.6, which is divided into two parts: the first section discusses organizational and legal aspects, while the second portion describes resource provision.

We will create a SWOT matrix for LLC "DCMP" based on previously acquired data (Table 2.7).

Table 2.7

SWOT matrix of LLC "DCMP"

	Strengths	**Weaknesses**
Enterprise	Close relationships with suppliers	Information support is satisfactory
	Established product sales channels	Pricing does not take into account market trends
	High quality of certain types of products	Low level of costs for marketing activities, in particular for market research
	Financial support allows investment activities	
	Opportunities	**Threats**
Market	Interest of foreign investors	Low level of profitability
	The possibility of introducing regulatory support for the development of the industry on the part of the state	Uncertainty of legislative regulation
	High barriers to entry into the industry due to high image requirements from partners	A significant number of active competitors on the market

In our opinion, LLC " DCMP's" main weaknesses are as follows: LLC "DCMP" does not offer discounts to repeat customers and does not promote (as a potential marketing tool) the promotion of long-term relationships; the business has a stable market and room for improvement, but there are no prospects with the current assortment; the marketing department only handles customer interactions and in reality handles the duties of a sales manager; ways to improve the effectiveness of the company's marketing strategy.

CHAPTER 3
VALUE CREATION AND THE ROLE OF DATA IN B2B PLATFORMS

3.1. B2B Platforms: Value Creation and the Impact of Data

First of all, it is fair to say that the body of research on value (co)-creation in platforms and specifically business-to-business ones is rather fragmented. Many publications come up with new conceptual frameworks (e.g., for specific industries). Therefore, it makes sense to use the industry-based structure of the research streams that is described in the previous section.

The first stream – general platform literature (with mostly B2C examples) – constitutes the fact that the value creation process is the main point that differentiates platform business models from traditional businesses. The value is created not inside but outside of the firm by multiple external actors, participants of the platform ecosystem (de Reuver et al., 2018). The main responsibility of the platform itself is to facilitate this process and interactions between suppliers and users (Parker et al., 2016; Van Alstyne et al., 2016).

There were a few attempts to establish a framework to describe the value creation process. For instance, Parker et al. (2016) highlight four different types of value created by the platform: the content itself for users, the access to the platform community for producers, interaction facilitating tools, and matching mechanisms for both users and producers. Another framework is proposed by de Oliveira and Cortimiglia (2017), describing the five dimensions of value creation in multisided platforms: process, actors, management, results, and barriers/drivers. Neither of these, however, is widely accepted and used in other publications.

This section presents the findings from the literature review regarding the process of value creation in B2B platforms and then conceptualizes the role data plays in it, which is followed by the second research question.

First off, it's fair to say that the body of research on value (co)creation in platforms, particularly business-to-business ones, is somewhat dispersed. Numerous publications develop novel conceptual frameworks (for instance, for particular industries). Therefore, it makes sense to use the research streams' industry-based structure, as described in the previous section.

The value creation process is the key element that distinguishes platform business models from traditional businesses, according to the first stream of general platform literature (with examples that are primarily B2C). According to de Reuver et al. (2018), a number of external actors who are part of the platform ecosystem create value not within the company but rather outside of it. This process and the interactions between suppliers and users are primarily the platform's responsibility (Parker et al., 2016; Van Alstyne et al., 2016).

A framework to explain the value creation process has been attempted a few times. Parker et al. (2016), for instance, highlight four distinct types of value created by the platform: the content itself for users, access to the platform community for producers, interaction-facilitating tools, and matching mechanisms for both users and producers. De Oliveira and Cortimiglia (2017) put forth a different framework that outlines the five aspects of value creation in multisided platforms: process, actors, management, results, and barriers/drivers. But neither of these is a common practice or cited in other works. First of all, it is fair to say that the body of research on value (co)-creation in platforms and specifically business-to-business ones is rather fragmented. Many publications come up with new conceptual frameworks (e.g., for specific industries). Therefore, it makes sense to use the industry-based structure of the research streams that is described in the previous section.

The first stream – general platform literature (with mostly B2C examples) – constitutes the fact that the value creation process is the main point that differentiates platform business models from traditional businesses. The value is created not inside but outside of the firm by multiple external actors, participants of the platform ecosystem (de Reuver et al., 2018). The main responsibility of the

platform itself is to facilitate this process and interactions between suppliers and users (Parker et al., 2016; Van Alstyne et al., 2016).

There were a few attempts to establish a framework to describe the value creation process. For instance, Parker et al. (2016) highlight four different types of value created by the platform: the content itself for users, the access to the platform community for producers, interaction facilitating tools, and matching mechanisms for both users and producers. Another framework is proposed by de Oliveira and Cortimiglia (2017), describing the five dimensions of value creation in multisided platforms: process, actors, management, results, and barriers/drivers. Neither of these, however, is widely accepted and used in other publications.

Nevertheless, the majority of platform literature divides platforms into two categories: transactional platforms (such as the Amazon marketplace) and innovative platforms (such as Android and Apple IOS). However, there appears to be a shift in favor of a hybrid model that combines these techniques. For instance, Apple offers both the technological foundation and the AppStore, where third-party developers can sell their apps (Cusumano et al., 2020). This taxonomy is also used by Hein et al. (2019), who identify transaction and innovation as two potential value creation mechanisms. However, platforms frequently use both. For the purposes of this paper, the platforms that are more concerned with the transactional mechanisms of value creation are referred to as transaction platforms, while those that place a strong emphasis on innovation activities, even when transaction mechanisms are also present, are referred to as innovation platforms.

The second stream, which consists of literature on industry-neutral B2B platforms, also suggests various frameworks for various facets of value creation. Grover and Kohli (2012), for instance, identify four layers of value creation in multifirm environments (which essentially fit the definition of platform ecosystems): relationship-specific assets, knowledge-sharing practices, complementary resources and capabilities, and effective governance. The classification for cocreation practices in B2B ecosystems proposed by Marcos-Cuevas et al. (2016) is as follows: co-diagnosing, co-testing, co-design, co-

developing, co-launching, co-ideation, and co-valuation. As with their aforementioned B2C counterparts, these frameworks aren't widely accepted in the literature.

The three identified literature sub-streams of explicitly B2B-oriented platform publications are divided into one of these two categories based on the widely used typology of innovation and transaction mechanisms of value creation described above: enterprise software and industrial Internet of Things platform papers would be part of the innovation group, and B2B e-marketplace publications - the transaction one.

There is little research on value creation in B2B marketplaces, but what little there is tends to highlight the same behaviors as the B2C definition of transaction platform. Li and Pénard (2014) specify that such an industrial marketplace comprises both buyers and sellers and facilitates transactions between them by way of matching and trading services. This indicates that value is produced in two ways: by matching the appropriate sellers with the appropriate buyers and by acting as an intermediary to facilitate the exchange itself afterward.

According to Rusthollkarhu and Aarikka-Stenroos (2019), value is produced through user-side interaction with supplier value propositions. This means that for a platform to generate value, having sellers on board is not sufficient; instead, it is essential to enable and facilitate buyers' interaction with these value propositions. In order to gain a competitive edge, some recent examples from the real world, such as data sharing platforms (Richter & Slowinski, 2018; Otto & Jarke, 2019), demonstrate the tendency that traditional value creation practices in B2B marketplaces should be complemented by new value-adding services on top (for example, data analytics). Blockchain-based marketplaces and smart contracts are another emerging trend that enable transactions and add value by fostering trust in such marketplaces (Mazur, 2020).

The literature in this sub-stream investigates the phenomenon of value co-creation in the intricate networks of multiple firms, which function essentially as platforms. The primary distinguishing characteristic, however, is that the platform

owner (for example, an ERP vendor) already offers the core product and does not solely rely on third-party content creators, who in this case provide add-ons, customization, knowledge of the industry, consulting, etc. (Ceccagnoli et al., 2012; Sarker et al., 2012). By indicating compatibility with the main product, these independent software vendors (ISV) gain access to its user base (Ceccagnoli et al., 2012).

Exchange, addition, and synergistic integration are three qualitatively different value co-creation practices (also known as modes) between platform owners and partners in such ecosystems that Sarker et al. (2012) propose as a useful framework. In an exchange mode, each party contributes resources to the other in order to efficiently serve the client (for instance, the platform owner might use developers from partners' companies in return for hourly pay). In addition mode, the parties build on one another's contributions to create new revenue streams (for instance, a partner sells the license of the platform's core product, receives a portion of the license fees, and may offer additional consulting services; the platform owner need not establish a worldwide sales network himself). The final method of synergistic integration involves the co-development of new products using the complementary domain expertise and resources of each actor (for instance, the platform owner develops and incorporates a few vertically-specific add-on solutions into the software core with the assistance of the partner's industry expertise).

By managing the boundary resources, "software tools and regulations facilitating the arms' length relationships between the involved parties", Förderer et al. (2018) contend that these value co-creation practices can be made easier. The topic of boundary resources in the context of value co-creation practices is covered in more detail in the section on industrial Internet of Things platforms, but software development kits (SDKs) and application programming interfaces (APIs) are a couple of examples to mention here for clarity. The platform owner offers these resources to standardize and encourage outside innovation on the platform.

In their investigation of the SAP developer community, Kauschinger, Schreieck, Boehm, and Krcmar (2021) demonstrate how the platform's core and the aforementioned boundary resources can both benefit from the developers' input. Such a procedure would also fall under Sarker et al. (2012)'s classification of value co-creation's synergistic integration mode.

The B2B platform literature has recently seen a slight increase in interest in the industrial Internet of Things platforms. In order to co-create comprehensive IoT solutions for the user companies, these platforms link a large number of heterogeneous actors, such as sensor manufacturers, machine tool companies, and component providers (Russo & Albert, 2018; Petrik & Herzwurm, 2019; Endres et al., 2019; Pauli et al., 2020; Pauli et al., 2021). To put it simply, sensors from sensor manufacturers are installed on the user company's production equipment in order to collect operational data, analyze it with the aid of applications created by outside software vendors, and use the results to improve internal workflows at the focal user company.

According to Gerrikagoitia et al. (2019), some users are service providers, their primary source of raw material is data, and the offered product is typically a software app as a value-added data-driven service. A reliable technology infrastructure is necessary for value creation [...]. Users and partners of the digital manufacturing platform can create apps and value-added data-driven services thanks to the infrastructure component of the platform.

The development of a burgeoning ecosystem of data-driven service consumers and producers depends on the ability to create and deploy software apps on the platform. 2019: p. 7 (Gerrikagoitia et al.). Shared resources are used to create value on B2B platforms (Falk & Riemensperger, 2019). As a result, the idea of boundary resources that was discussed in the earlier section of this subsection is crucial to the value co-creation process in iIoT platforms. The framework created by Hein et al. (2019), which is based on the example of iIoT platforms and the idea of boundary resources, introduces three main value co-creation practices in B2B platforms. Other scholars have used this framework, which has strong descriptive

power (see, for instance, Petrik & Herzwurm, 2019). In order to better understand the value co-creation process in the iIoT platforms, it is described in more detail here. All value co-creation techniques are divided into three categories by Hein et al. (2019): supply-side, demand-side, and core. The supply-side practice consists of the following three mechanisms: integration through abstraction (customer internally develops some industry- and case-specific application on the basis of the platform and can then submit it to the platform owner, who helps to generalize the solution an), integration through self-service integration (platform owner provides APIs, how-to guides, and other boundary resources, using which partners develop their own complementary applications for the platform), and integration through boundary resources. The demandside practice includes two additional mechanisms: supported readiness (customer companies pay for the assistance of consulting firms who are also members of the platform ecosystems to ensure their compatibility with the platform) and self-service readiness (customer companies use boundary resources in the form of how-to guides and documentation to make their internal infrastructure compatible with the platform). The customer actually using the applications and services listed on the platform represents the core value co-creation practice.

The role of data in these processes can now be understood as key value (co)creation practices in various B2B platform types. Four conceptual roles of data were identified in this paper: product, fuel, input/output of the solution, and boundary resource.

When data is directly sold on the platform as a product to be purchased (such as the data sharing platforms investigated by Richter and Slowinski (2018) and Otto and Jarke (2019)), or when the platform collects the data and shares it with or sells it to the advertisers/suppliers, data plays this role. Customers may also be provided with data as part of search algorithms and transparency. This function is more typical of transaction platforms, so in B2B, it would be most prevalent on the e-marketplaces mentioned above as facilitating mechanisms. This is because

the platform makes it simple for customers to compare various suppliers, and it also gives suppliers access to customer analytics.

In contrast to the product role, the platform owner, not the counterparts, is the one who directly extracts value. One of the two value co-creation practices proposed by Li and Pénard (2014) uses data about actors and their interactions on the platform as a source to improve the accuracy of supplier and user matching algorithms on transaction platforms.

Another instance would be if the platform owner shared this data with suppliers to improve the product or platform itself. This would fall under Grover and Kohli's (2012) classification of value co-creation and be considered the knowledge sharing layer.

The general platform data literature also acknowledges these first two roles: "Platforms primarily produce value by coordinating platform participants' activities using data. Other platforms use gathered and observed data to foster innovation, not only internally but also through external communities of complementors (e.g., Atlassian, SAP), while trading in individual and aggregate data plays a central role in monetization and revenue strategies focused on facilitating transactions for many platforms (e.g., Uber, Facebook). Bhargava and colleagues, 2020, p. 324.

Internal organizational data of the customer company is something that the application (such as ERP or iIoT) manages in enterprise software platforms (Ceccagnoli et al., 2012). For instance, the platform's data on raw material consumption is gathered and analyzed by the solution, adding value for the user. This data does not even have to be present on the platform, which is the main distinction from the earlier roles. It merely serves as input and output for the purchased software; it is not used to enhance the platform or its algorithms. The need for these applications to manage their internal data is the primary driver behind user companies' purchases and implementations of platform solutions.

The boundary resources concept is frequently emphasized in papers like Hein et al. (2019), Petrik and Herzwurm (2019), and Pauli et al. (2021). Data can

shape boundary resources (for example, feedback data from the community of third-party developers; Kauschinger et al., 2021) or even be one itself. Data can serve as a boundary resource, according to Otto and Jarke (2019), who also point out that there isn't much research on this subject yet. An illustration would be the knowledge created from the data the platform collected and implemented in boundary resources like how-to manuals, documentation, or APIs. Another illustration is provided by Pauli et al. (2021) who state that "[...] digital platforms allow for the collection and analysis of data from a variety of industrial assets and devices, ranging from tools and machines to vehicles or entire warehouses and factories. An ecosystem of independent businesses is typically given access to this data so they can create complementary products like services and applications for industry (2021, p. 181, Pauli et al.).

3.2. Evaluation of the Effectiveness of the Business Model of the Enterprise During the Implementation of the Investment Project

As a result of the research, it was determined that by enhancing their operational properties—water resistance, water resistance, and frost resistance—lime building materials and products based on them could be used in a wider range of applications. By using polymeric components for various purposes and by establishing conditions that allow for the maximum rate of lime carbonation, these properties of lime materials and products can be improved. In order to increase the slaked lime's capacity for carbonate hardening, the main directions for improving its properties are related to obtaining the smallest Ca(OH)2 particles to colloidal sizes.

Water and quicklime with active calcium and magnesium oxides are combined to create slaked lime. It is a viscous substance. When cooked, the white powder transforms into lime paste or milk of lime. Application of the material: in

agriculture, the chemical industry, construction, personal farms, and environmental protection.

The whitewashing of walls in residential and non-residential buildings, the addition to plaster solutions, masonry, and putty as an additional element all involve the use of this material. Slaked lime is elastic, hard, lump-free, and manageable all at the same time. It can be kept for six months undiluted. Fruit trees are whitewashed to deter pests, and slaked lime is used to fertilize soils in agriculture.

Additionally, calcified water, chlorine, bartolet salt, and calcium carbide are extracted from slaked lime and used in the chemical industry. By removing sulfur from flue gases, purifying water, and controlling its parameters, slaked lime helps to preserve the environment.

According to the marketing analysis of the construction lime market, only one company, out of the major producers, makes slaked lime. Although there is still a market for this kind of product. We suggest setting up a production line for hydrating construction lime in order to increase LLC "DCMP"'s market share.

There are numerous ways to get highly dispersed slaked lime today. Condensation processes that rely on creating supersaturated solutions of a dispersed phase substance in a dispersion medium with subsequent separation in the form of colloidal particles occupy a special place in this classification. They are processed by mixing different ingredients with slaked lime. Such techniques are efficient and simple to use while not requiring significant capital expenditures.

The hydration of CaO and crystallization of Ca(OH)2 can be slowed down by the addition of organic materials to slaked lime. The first of these is phenol, followed by lactose, raffinose, formic acid, and others. In contrast, the growth of Ca(OH)2 seeds is inhibited by organic compounds, which is the mechanism by which the hydration of CaO is slowed down. The quenching of CaO in a molasses solution (0.2–3.3%) and subsequent cooling of the solution are suggested as a method for producing colloidal lime. The obtained mass is then washed with water in a ratio of 0.25 to 0.6 liters for every kilogram of raw material.

Lime slaking is done on an industrial scale in hydrators of different designs, such as glass hydrators, multi-drum hydrators, cylindrical and barrel-shaped slaking drums, etc. Since the rate of quenching doubles for every 10°C increase in temperature, hot water or steam is used to speed up the process.

We will assess the effectiveness of the suggested actions for the limited liability company "Dneprovskiy construction materials plant" as well as the return on investment from the installation of a slaked lime production line.

Only after carefully examining the project performance criteria is it possible to decide whether to accept the project. according to the calculations in the table. As the total of the actual cash flows discounted over the course of the project, you can determine NPV in step 3.1.

NPV = -400000+ 129 600+ 97 920+ 74 419 + 56 872+ 43 689 = 2500,0 UAH.

The profitability index (PI) is a relative indicator that characterizes the specific profitability of capital and represents the ratio of the sum of the above effects to the amount of capital investments.

$$PI = 402500/400000 = 1{,}006$$

Table 3.1

Calculation of the investment project profitability for the introduction of the automatic system of lime hydration “VIK_56” at LLC “DCMP”

Indicator	Years of the project					
	2024	2025	2026	2027	2028	2029
The cost of the automatic system "VIK_56", thousand UAH	400000	0	0	0	0	0
Economic effect of the introduction of the lime hydration line, thousand UAH	0	102000	102000	102000	102000	102000
Depreciation deductions, thousand UAH (15% on residual value)	0	60000	51000	43350	36847,5	31320,38

Net cash flow, thousand UAH	0	162000	153000	145350	138847,5	133320,4
Discount factor (with a discount rate of 25%)	1	0,8	0,64	0,512	0,4096	0,3277
Discounted net cash flow, thousand UAH	-400000	129 600	97 920	74 419	56 872	43 689
Cumulative cash flow, thousand UAH	-	(270 400)	(172 480)	(98 061)	(41 189)	2 500

The internal rate of return (IRR) is the discount rate (d) at which the stated capital investment and the value of the stated effects (IRR) are equal.

$$IRR = 25 + \frac{2500}{43689 - (-41189)}(40 - 25) = 25{,}3\%$$

The minimum amount of time from the start of the project's implementation (the investment), when the costs related to the project's implementation are covered by the project's overall results, is known as the payback period of capital investments (PBP).

$$PBP = 4+(56872–43689)/\ 43689= 4{,}3 \text{ years}$$

We will assess the project's economic efficiency indicators, which are shown in table 3.2, based on the data we have received.

Table 3.2

Evaluation of economic efficiency indicators of the project at LLC "DCMP"

Indicator	Indicator level
Net present value (NPV), UAH.	2500,0
Profitability index	1,006
Internal rate of return (IRR), %	25,3
Payback period of the project, years	4,3

If the following criteria are met, the project is deemed appropriate: the net present value (NPV) value exceeds the investment amount; the project's payback period does not exceed the period of operation; and the profitability index is greater than one (if the aforementioned criteria are satisfied). Because the IRR exceeds the investment amount by UAH 2,500, the project's payback period is 4.3 years, and the profitability index is 1.006, the proposed project is expedient. The

introduction of the automated lime hydration system "VIK_56" in LLC "DCMP" will be evaluated economically (table 3.3).

The installation of the slaked lime production line will result in a 12.89%, or UAH 22.25 million, increase in LLC "DCMP"'s production costs. Sales rose by 14.68% at the same time as profit nearly doubled. The increase in net profit will be in the amount of 3.7 million hryvnias if revenue growth outpaces cost growth. The range of building lime will be widened, increasing the profitability of LLC "DCMP" by 1.8 percentage points. The activity of LLC "DCMP" will now produce slaked lime, which will increase this company's market share in building lime by 1.4 percentage points. The company's financial situation will be strengthened by this development, which will also help it gain ground in the market for building supplies.

Table 3.3

The primary measures of LLC "DCMP" activity taking into account the investment project

Indicator	2022	Project 2025	Deviation of the 2022 level from 2025	
			absolute	relative, %
Net income, thousand UAH.	176483	202 391	25907,7	14,68
Current production costs, total, thousand UAH.	172650	194900	22250	12,89
Net profit (loss), thousand UAH.	3833	7491	3658	95,43
The average registered number of employees, persons	203	215	12	5,91
Labor compensation fund, thousand UAH	23482	30526,6	7044,6	30,00
Labor productivity of 1 average employee, thousand UAH/person	869,4	941,35	71,98	8,28
Average annual salary of 1 average employee, thousand UAH/person	115,67	141,98	26,31	22,74
Average annual cost of fixed assets, thousand UAH.	137071	137471	400	0,29
Funding of 1 average accounting employee, UAH 1,000/person	675,2	639,4	-35,8	-5,31
Fund return of net income for UAH 1. cost of fixed assets, UAH/UAH	1,29	1,47	0,18	14,35

Profitability (loss) of assets, %	3,65	5,45	1,80 в.п.	X
Profitability (loss) of activity, %	2,22	3,84	1,62 в.п.	X

As a result, it was determined from the research that the key component of the company's current business model is the ongoing analysis of consumer satisfaction levels and the search for ways to raise them in order to develop new kinds of products that better meet consumer needs. The primary function of an organization's business model is to translate its internal "inputs" (resources, technologies, abilities, and competencies) into its external "outputs" (economic value for customers and financial results for the organization) (Fig. 3.1).

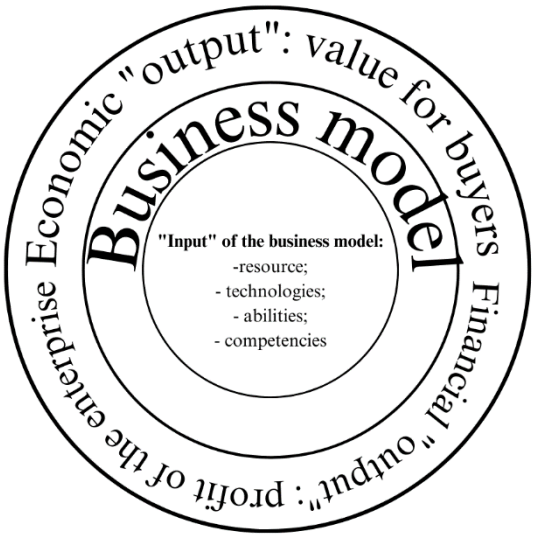

Fig. 3.1. A "content" projection of the enterprise's business model

Because of this, the implementation of this project as part of the company's innovation and investment activities is a crucial component of its current business model. The goal of the innovative marketing strategy, which encompasses all projects, is to identify new avenues and opportunities for utilizing the manufacturer's potential, develop new products and technologies on this foundation, and market them. The innovation cycle is a phase that innovations (innovative projects) go through. It starts with the conclusion of a license agreement and ends with industrial production.

The dissemination of scientific, technical, and market information in agricultural formations of various organizational and legal forms of management in the region, the organization of implementation demonstrations, participation in exhibitions, fairs, conferences, meetings, seminars, the organization of field days, courses, radio- and teleconferences, and the creation and printing of methodological reports were all ways that scientific and advisory support for the transfer of innovations was carried out.

CONCLUSION AND PROPOSALS

This paper conducted an analysis of the literature on B2B platforms and their ecosystems with the goal of putting this knowledge to use. As a result, the key distinctions from platforms active in the B2C market were determined. First off, unlike consumer goods that are more commonly mass-marketed, straightforward, and used in everyday life, industrial platforms offer niche, technically complex, and important for key business processes products and services. Second, while individual consumers are generally homogeneous, the participants in the ecosystems of industrial platforms are more diverse, including firms from a wide range of different industries and firms that differ significantly even from within the same industry. The winner-takes-all dominance that is typical of B2C platforms is less likely due to the first two differences because there are fewer actors in the ecosystems of B2B platforms and there are fewer network effects.

In addition, the process of value creation in B2B platform ecosystems was investigated, and the main frameworks of value creation practices developed by the academics for various industries and platform types (transaction, innovation, and hybrid) were identified. The conceptual roles of data in these practices were then derived and summarized from the B2B platform literature: data as a product to be offered on the platform, data as a fuel for innovation and matching algorithms on the platform, data as a solution's input/output for the applications offered on the platform, and data as a boundary resource to bring multiple parties together in the process of the common value creation.

The literature review adds to the theory surrounding platforms and gives practitioners practical tools for a more in-depth analysis of their industrial platforms and how they generate value. In order to complete the picture of value creation in industrial platforms in relation to the potential implementation of cutting-edge technologies like blockchain or artificial intelligence, this paper also makes suggestions for future research directions.

The financial statements of the Limited Liability Company "Dneprovskiy construction materials plant " are used in the practical section of this essay. Since 1959, this company has been one of Ukraine's major producers of building supplies. The enterprise's resource potential enables it to produce up to 10 million conventional wall silicate bricks each month.

The enterprise's overall production volume decreased by UAH 8,193,000. In 2022, a decline is seen, and the war in Ukraine is to blame. After a full-scale war broke out at the beginning of 2022, production was frozen from March to June, which led to a decline in production volumes. Particularly, the production of lime fell by 13.83 thousand UAH, causing a loss of 11,748 thousand UAH.

The revenue from its sale increased by 3.6 million UAH as a result of the increase in silicate brick's price. Therefore, as construction in the area slowed as a result of the war, the demand for building materials also decreased. In comparison to 2020, LLC "DCMP"'s sales volume decreased by 5.01% in 2022. Falling production is related to declining sales. The profitability of assets and activities increased by 2.00 and 1.80 percentage points, respectively, as a result of a decrease in costs of 6.66% and an increase in net profit (+77.45%).

It is advised that the investigated enterprise be elevated to a higher level of management by partially modernizing and updating its fixed assets and partially diversifying its production to meet the demands of the construction market in order to increase the profitability of the business. The main flaws of LLC "DCMP"'s business model include: the lack of a system of discounts for loyal customers and low costs for marketing activities; the company's failure to diversify and update its product line in the face of a stable market; the use of 60–70% of its fixed assets; and the failure to develop methods to improve the strategy of LLC "DCMP" and evaluate management effectiveness.

According to the building lime market research that was done, only one company out of the major producers in this market makes slaked lime. Although there is still a market for this kind of product. We suggest setting up a production

line for hydrating construction lime in order to increase LLC "DCMP"'s market share.

If the following criteria are met, the project is deemed appropriate: the net present value (NPV) value exceeds the investment amount; the project's payback period does not exceed the period of operation; and the profitability index is greater than one (if the aforementioned criteria are satisfied).

Because the IRR exceeds the investment amount by UAH 2,500, the project's payback period is 4.3 years, and the profitability index is 1.006, the proposed project is expedient. The installation of the slaked lime production line will result in a 12.89%, or 22.25 million UAH, increase in LLC "DCMP"'s production costs.

Sales rose by 14.68% at the same time as profit nearly doubled. The increase in net profit will be in the amount of 3.7 million UAH if revenue growth outpaces cost growth. The range of building lime will be widened, increasing the profitability of LLC "DCMP" by 1.8 percentage points.

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APPENDIX

APPENDIX A

Google Scholar	Results	After 2010	Chosen from the 50 most relevant
B2B Platforms +	50800	20500	2
Value Creation	20000	17000	3
Platform Economy	17500	17500	4
Data	19200	18000	4
Ecosystem	17500	17300	3
Platform Owner	16400	14900	4
Network Effects	17400	17400	2
iIoT + Platform	6210	6080	2
Data + Network Effects + B2B	26000	20800	0
Total	191010	149480	24
AIS eLibrary	Results		Chosen
EJIS	20		0
ISJ	20		1
ISR	20		1
JIT	21		0
JMIS	22		0
JSIS	23		0
JAIS	24		1
MISQ	25		2
Total	26		5
From citations and references (including starting literature)			**10**
Total			39

APPENDIX B

Source	Product			Size of the ecosystem	Heterogeneity of actors	Power of network effec	Value co-creation		Role of Data			
	Niche nature	Technical complexity	Importance of product for business processes				Transaction	Innovation	Product	Fuel	Solution's Input/Output	Boundary resource
Bhargava et al., 2020						x	x	x	x	x		
Buchinger et al., 2014	x				x						x	
Ceccagnoli et al., 2012								x			x	
Cusumano et al., 2020							x	x				
de Oliveira & Cortimiglia, 2017								x		x		
de Reuver et al., 2018								x		x		
Drewel et al., 2020					x			x	x	x		
Endres et al., 2019					x			x	x		x	
Falk & Riemensperger, 2019	x					x		x	x		x	
Förderer et al., 2018		x						x		x	x	x
Gerrikagoitia et al., 2019								x	x		x	
Gleiss et al., 2021							x	x	x	x	x	
Grover & Kohli, 2012							x	x	x	x		
Hasler et al., 2020							x	x	x		x	
Hein et al., 2019		x	x		x			x	x		x	x
Hein et al., 2020							x	x	x			
Hodapp et al., 2019								x			x	x
Kauschinger et al., 2021								x		x		
Kenney et al.,			x			x	x	x	x			

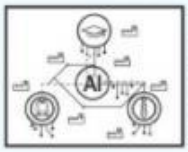
2019												
Li & Pénard, 2014						x	x		x	x		
Malthouse et al., 2019					x		x	x	x	x		
Marcos-Cuevas et al., 2016			x		x			x			x	x
Mazur, 2020							x		x			
Otto & Jarke, 2019				x				x				x
Parker et al., 2016						x		x	x	x		
Pauli et al., 2020		x		x		x		x	x	x		
Pauli et al., 2021	x	x	x	x	x	x		x				x
Petrik &Herzwurm, 2019	x		x	x	x	x		x			x	x
Pidun et al., 2020								x				
Richter & Slowinski, 2018							x	x	x	x		
Riemensperger &Falk, 2020	x	x				x		x			x	
Russo & Albert, 2018	x			x	x			x	x			
Rusthollkarhu &Aarikka-Stenroos, 2019							x			x		
Sarker et al., 2012							x	x			x	x
Schermuly et al., 2019	x	x			x	x		x	x	x		
Schreieck et al., 2017	x			x	x	x		x			x	
Tan et al., 2020					x						x	x
Van Alstyne et al., 2016							x	x		x		
Wallbach et al., 2019						x	x				x	

Appendix C

Digital AI-Marketplace for Product Development

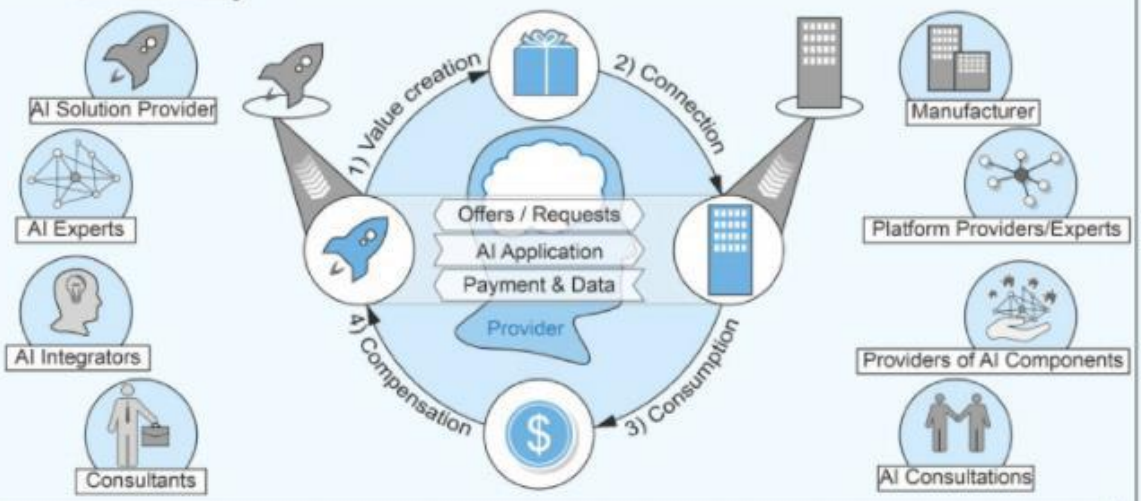
marKIplatz

Vision: An ecosystem for AI solutions



The AI marketplace is a digital platform that connects manufacturers of AI applications for product development with manufacturing companies. Manufacturing companies can, for instance, have existing design drawings optimized with the help of an AI application (e.g. with regard to material consumption). The AI marketplace supports all participants in the ecosystem with needs-oriented solutions.

Functionality



The **provider** of the AI marketplace controls the intellectual assets and manages the overall architecture.	**AI solution providers** offer ready-to-use software via the AI marketplace.	**AI experts** provide algorithms or solutions that are necessary for the function of the platform itself.
AI integrators develop customized applications for businesses.	**Consultants** from specialised departments clarify questions regarding data security, data sovereignty etc.	**Providers of AI components** contribute AI algorithms that are integrated into the applications.
Platform providers/experts provide IT infrastructure or expertise for the setup.	**Users** are looking for AI-based solutions to improve their development processes.	**AI consultations** support e.g. the identification of potentials or the introduction of applications.