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INFLUENCE OF PERCEIVED BUSINESS ECOSYSTEM VALUE ON INTENTION TO USE NEW E-SERVICES: THE CASE OF YANDEX

Master's Thesis by the
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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ABSTRACT

Master Student's Name	Vostrikov Ivan Alexandrovich
Academic Advisor’s Name	Olga Rafailovna Verkhovskaya
Master Thesis Title	Influence Of Perceived Business Ecosystem Value On Intention To Use New E-services: The Case Of Yandex
Description of the goal, tasks and main research results	Presented Master Thesis aims to investigate factors of evaluation of perceived value of digital business ecosystems (DBEs) among Generation Z clients and how value influences intention to use services within such ecosystem. The study employed Structural Equation Modeling (SEM) to analyze data collected from Generation Z consumers. The Yandex company was used as an illustrative example of a DBE in the research. Additionally, the study examined the innovativeness and tech addiction of Generation Z and influence of synergetic instruments such as multi-service subscription and loyalty incentives. The findings of this research revealed that the dimensions of consumption values (novelty, social, hedonic, and usefulness) within the Yandex digital business ecosystem exhibited substantial explanatory power in understanding Generation Z consumers' intention to use new ecosystems’ services. Moreover, the study validated the applicability of Theory of Consumption Values (TCV) in the context of business ecosystems. The findings indicated that the innovativeness of Generation Z did not significantly contribute to their perceived value, suggesting a difference between Generation Z and Millennials. Furthermore, the study found that multi-service subscriptions had a positive influence on value and intention to use, while loyalty incentives in the form of cashback did not yield significant results. Findings from this paper have important implications for practitioners and decision-makers in the field of digital business ecosystems who are concerned with value configuration activities.
Keywords	Digital business ecosystem, value creation, consumption values, consumer behavior, ecosystem configuration

АННОТАЦИЯ

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Название ВКР	Влияние воспринимаемой ценности бизнес-экосистемы на намерение использовать новые электронные услуги: на примере Yandex
Описание цели, задач и основных результатов ис следования	Представленная ВКР направлена на исследование факторов восприятия потребителями поколения Z ценности цифровых бизнес-экосистем и как эта оценка влияет на их намерение использовать новые услуги в рамках таких экосистем. В исследовании была использована модель структурного уравнения (SEM) для анализа данных, собранных среди потребителей поколения Z. Компания Yandex была использована как иллюстративный пример цифровой бизнес экосистемы в исследовании. Кроме того, была рассмотрена инновационность и зависимость от технологий поколения Z, а также влияние синергетических инструментов, таких как многопрофильная подписка и стимулы лояльности. Результаты этого исследования показали, что измерения потребительских ценностей (новизна, социальность, удовольствие и полезность) в рамках цифровой бизнес-экосистемы Yandex имеют значительную объяснительную силу для понимания намерения потребителей поколения Z использовать новые услуги в рамках экосистемы. Кроме того, в ходе исследования было подтверждено применимость теории потребительнских ценностей (TCV) в контексте бизнес-экосистем. Полученные результаты указывают на то, что инновационность поколения Z не вносит существенный вклад в их воспринимаемую ценность, что свидетельствует о различиях между поколением Z и миллениалами. Кроме того, исследование показало, что многопрофильные подписки положительно влияют на ценность и намерение использования, в то время как стимулы лояльности в виде возврата денег не принесли значимых результатов. Полученные в статье результаты имеют важное значение для практиков и принимающих решения в области цифровых бизнес-экосистем, которые интересуются активностями по конфигурации ценности.
Ключевые слова	Цифровая бизнес-экосистема, создание ценности, потребительские ценности, поведение потребителя, конфигурация экосистемы

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INTRODUCTION

Research motivation and research gap

The rapidly evolving business environment has compelled companies to seek competitiveness and outperform their competitors. The advent of the internet and the era of information technology have introduced numerous changes to established norms. Over the past two decades, every aspect of business has undergone significant transformations: marketing approaches, resource management, value creation, and even organizational structures, with many companies becoming decentralized and employing globally distributed workforces.

One of the areas where revolutionary changes have occurred in terms of business organization is strategy and structure. Current trends require companies to prioritize the quality of their decisions, carefully and accurately research the market, and design and create products that best resonate with their customers. One concept that companies are increasingly adopting to shape their structure and ensure their competitive advantage is the notion of business ecosystems.

A business ecosystem can be thought of as a dynamic network of interconnected organizations, stakeholders, and resources that collaborate to create and deliver value to customers. It goes beyond traditional supply chains and incorporates a broader ecosystem perspective that encompasses customers, partners, suppliers, and even competitors. Business ecosystems provide the actors with a competitive advantage through the facilitation of collaboration, innovation, and the creation of mutually beneficial relationships, enabling companies to leverage their collective strengths and deliver superior customer experiences.

While there are various types of business ecosystems, this study aims to focus on product-based digital business ecosystems (DBEs). This type of ecosystem allows for a holistic view of value creation through a combination of value propositions that leverage positive perceived value by consumers. Additionally, the integration and exchange of data and information among participants in DBE enables rapid response to changing needs and the adjustment of value propositions through the creation of new services, the provision of new features, or the inclusion of new participants. The DBE approach has proven valuable for further differentiation and diversification of business activities, demonstrating a new form of relationship between business partners that leads to improved competitive advantage.

As an example, Amazon, with its extensive ecosystem comprising sellers, logistics providers, and service providers, has transformed the retail industry. Through its ecosystem, Amazon offers customers a seamless and integrated experience, from browsing and purchasing products to fast and efficient delivery. By leveraging the capabilities and resources of its ecosystem partners, Amazon

has created a unique value proposition that combines convenience, extensive product selection, and reliable service.

Despite the growing popularity of business ecosystems, there remains a pressing need for empirical and quantitative research to validate and expand our understanding of their effectiveness. Currently, a significant portion of the existing literature on business ecosystems is primarily conceptual, focusing on theoretical frameworks and qualitative analyses of individual cases. Moreover, given that DBE involves the use of various e-services by consumers, it is particularly important to examine their perception of e-services and IT products from their unique perspective.

Additionally, there is the urgency and necessity of understanding Generation Z's behavior within digital business ecosystems. Previous research in this area has been limited, emphasizing the need for focused studies specifically on Generation Z within the context of digital business ecosystems. Such research can yield valuable insights into how Generation Z perceives and evaluates these ecosystems, enabling ecosystem participants to develop strategies and personalized experiences that effectively cater to their distinct preferences.

Therefore, to advance the field and provide actionable insights for practitioners, a deeper understanding of Generation Z customers' perceptions of the value of business ecosystems is essential. This is particularly needed in order for practitioners to construct their value proposition and adjust it to Generation Z, which is unique in terms of its relationship with information technology and perception. It is therefore particularly important to understand the factors that drive their intention to use ecosystems and how they perceive the value of ecosystems.

We will examine Yandex as a representative example of a digital business ecosystem. Yandex encompasses a wide range of services catering to diverse consumer segments. Within this ecosystem, the actors demonstrate co-evolutionary characteristics as they simultaneously compete and cooperate to attract customers. Orchestration is facilitated by a focal actor, ensuring seamless coordination among the ecosystem participants. The services offered are complementary, enabling the exchange of data and information, which is utilized to maintain relevance and adapt the value proposition for clients. In terms of criteria used in the literature on business ecosystems, this example of Yandex outperforms other ecosystems in Russia, showcasing superior qualities in various aspects.

In conclusion, the emergence of business ecosystems represents a transformative shift in organizational structure and strategy. Therefore, empirical and quantitative research is necessary to validate and expand our understanding of their effectiveness in meeting customer needs and driving competitive advantage. This study aims to fill this gap by examining customer perceptions and the integrated value propositions within business ecosystems, thereby contributing to the ongoing evolution and practical application of ecosystem thinking in the business world.

Research goal and questions

Research goal and objectives: the primary goal of the research is to explore the factors influencing the perceived value of digital business ecosystems and examine their influence on the intention to use new services among Generation Z customers. In order to achieve this goal, we formulated several objectives:

1. To provide a comprehensive overview of the literature on business ecosystems and describe its differences with other concepts and strategies,
2. To study the most recent and relevant research related to value in the context of ecosystems and the behavior of generation Z consumers;
3. To formulate a structural research model of value dimensions affecting the intention to use new services from DBE;
4. To collect primary data and test the formulated model;
5. Develop recommendations for strategy and marketing practitioners and decision-makers in the context of digital business ecosystems.

In this study, the following research questions were extended based on our research goal:

- What are the factors influencing the consumption value of Generation Z customers towards digital business ecosystem services, and do these customers perceive ecosystem value as a holistic construct?
- To what extent do tools designed to create synergy within ecosystems, such as loyalty programs and multi-service subscriptions, contribute to value and intention?
- Does the unique attributes of Generation Z consumers affect their intention to use the services of the ecosystem and their perception of the integrated value proposition of the business ecosystem?

This study is divided into four chapters:

The introduction provides a brief overview of theories and current issues examined in the context of the intersection between ecosystem theory and consumer behavior. It highlights research gaps and formulates research goals, objectives, and questions.

In Chapter 1, a theoretical overview of the business ecosystem literature is provided, distinguishing it from related concepts that are often misused. Specific attributes of the business ecosystem are comprehensively discussed, along with comparisons to other types of ecosystems such as entrepreneurial, innovation, and knowledge ecosystems. Furthermore, comparisons are made with other forms of value creation prisms, such as supply chains and value networks, and the distinctions between platform-based and product-based business ecosystems are explored. The chapter also delves into the concept of value creation, connecting it with consumer behavior studies on

consumption values and expanding on the dimensions that contribute to intention to use. Additionally, an overview of consumer behavior among Generation Z is provided, and a particular ecosystem is chosen for the study.

Chapter 2 discusses the methodology employed in the study. It references existing research scales related to consumption values and domain-specific innovativeness and measures the variables in the paper using a seven-point Likert scale. The chapter also covers the selection of the sample, the distribution channel of questionnaires, and the data analysis method.

Chapter 3 focuses on data analysis and presents the results. The analysis is performed using Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structures (AMOS) software, including descriptive statistics, screening of construct items for unidimensionality, reliability and validity analysis, model fit testing, path coefficient testing, and mediating effect testing. Conclusions are drawn based on the data analysis results. Practical implications for practitioners in digital business ecosystems are proposed, and the study's limitations are acknowledged, along with suggestions for future research on consumer behavior and the assessment of value propositions in business ecosystems.

CHAPTER 1. OVERVIEW OF THEORETICAL BACKGROUND

1.1 Business Ecosystem Value Creation theory overview

1.1.1 Studies on ecosystems

Since the first appearance of the term "ecosystem" in 1993, numerous studies have explored various aspects of ecosystems. However, the definition of an ecosystem remains broad and dependent on the scope of examination. The inclusion of various actors within an ecosystem makes it challenging to delineate its boundaries. Scholars began identifying and studying ecosystems with the introduction of the business ecosystem by Moore (1993).

Subsequently, the literature has conceptualized different types of ecosystems, including innovation ecosystems, entrepreneurial ecosystems, and knowledge ecosystems, each with its own origins and focus.

The prevalence of the concept and its application in various domains can be attributed to its significant explanatory power. Indeed, the systematic perspective provided by an ecosystem allows for an examination of interdependencies, evaluation of roles and contributions of participants, and assessment of ecosystem barriers. These mentioned ecosystems differ in their focus, with some providing a more systematic overview, while others concentrate on individual participants. To determine the position of business ecosystems among other ecosystems, let us consider the components encompassed by each concept.

The innovation ecosystem, as defined by Adner (2006), refers to the collaborative arrangements where firms combine their individual offerings into a coherent, customer-facing solution. This type of ecosystem emphasizes the development of innovations and the joint materialization of value propositions (Adner, 2006; Jacobides, 2018). Research on innovation ecosystems revolves around topics such as emergence, evolution, governance, value propositions, relationships, and business models (Suominen, 2019).

The knowledge ecosystem, defined by (Van der Borgh, 2012), represents a heterogeneous set of knowledge-intensive companies and participants that rely on each other for effectiveness and efficiency, often located in close proximity. Knowledge ecosystems focus on knowledge interactions among actors to generate new knowledge (Jarvi, 2018). Research on knowledge ecosystems explores mechanisms for knowledge exchange, boundary spanning, business models, and knowledge creation (Jacobides, 2018; Jarvi, 2018).

Finally, the entrepreneurial ecosystem encompasses studies on regulatory mechanisms, sociological investigations of entrepreneurs, infrastructure, knowledge transfer and spillovers, joint value creation, and the overall environment in which entrepreneurs operate. This broad approach to

defining the boundaries of an ecosystem explores various aspects but is not the focus of the current research (Wright, 2014).

Based on the information provided and the synthesized text, it can be concluded that while business ecosystems primarily emphasize value capture and exhibit a single partner orientation, innovation ecosystems, knowledge ecosystems, and entrepreneurial ecosystems shift their focus towards value creation and adopt a system-level orientation.

In a business ecosystem, as introduced by Moore (1993), the primary goal is both to create and to capture value by leveraging the interactions and relationships among various actors within the ecosystem. This often involves strategic collaborations, resource sharing, and mutually beneficial arrangements. The emphasis is on maximizing individual firm performance and competitiveness, even at the expense of competition within the ecosystem.

In contrast, innovation ecosystems, as defined by Adner (2006) and supported by Jacobides (2018), prioritize value creation through collaborative arrangements. The focus shifts towards combining individual offerings into coherent, customer-facing solutions that go beyond the capabilities of any single firm. The emphasis is on jointly developing and materializing innovative ideas, fostering creativity, and enhancing overall system-level effectiveness.

Similarly, knowledge ecosystems, as described by Van der Borgh (2012) and supported by Jarvi (2018), center around the creation and exchange of knowledge among heterogeneous participants. The primary objective is to leverage knowledge interactions and synergies to generate new insights and foster learning. Proximity and close relationships between actors are often crucial for facilitating effective knowledge transfer and collaboration.

Entrepreneurial ecosystems, as mentioned, encompass a wide range of factors and elements that support entrepreneurship and innovation. These ecosystems consider regulatory mechanisms, sociological aspects, infrastructure, and the overall environment in which entrepreneurs operate. The focus is on creating an enabling environment that nurtures and supports entrepreneurial activities, encourages risk-taking, and promotes the development of new ventures.

Despite the differences between types of ecosystems, one can mention that there are substantial overlapping features among them that can be applied to every ecosystem depending on its setting. Rising number of researches focus on the need of incorporating all elements of these ecosystems into one coherent concept in order to create sustainable innovations. Further, we will synthesize the main features that creates the setting of ecosystem in order to further provide a distinction of various types.

1.1.2 Ecosystem attributes of value creation process

To further distinguish an ecosystem from other perspectives such as value chains, supply chains, and value networks, it is necessary to explore the distinctive features of the ecosystem and its defining elements. These unique characteristics shape the interactions between actors, their roles and responsibilities, the structure of relationships, and the presence of partnership or competition. Analyzing boundaries becomes relevant for conducting a comparative analysis of different ecosystem types, as it sheds light on the similarities and differences while exploring how boundaries can be established across various contexts and types of ecosystems (Gulati, 2012). Each ecosystem exhibits a specific combination of boundaries that facilitate the achievement of its objectives, as defined by the respective ecosystem type (Valkokari, 2015). In the following section, we will discuss seven boundaries that have emerged from our analysis. This is particularly needed in the absence of clear boundaries between concepts. In order to provide a reliable view of the object of this research, we will provide additional dimensions to look at types ecosystems and how the business ecosystems are distinguished from them.

Orchestration

Orchestration within ecosystems involves an orchestrator who utilizes governance mechanisms to align partners and realize the joint value proposition (Ritala, 2013). The roles and approaches of ecosystem leadership vary across different types of ecosystems (Shipilov & Gawer, 2020). In business ecosystems, large firms like Microsoft, Google, Cisco, or Walmart often serve as orchestrators, benefiting their own organizations through setting participation rules and providing shared infrastructure (Clarysse, 2014; Iansiti & Levien, 2004; Kapoor & Argwal, 2017). On the other hand, innovation ecosystem orchestrators focus on managing resources, co-managing ecosystem evolution, aligning partner interests, and distributing value among partners (Adner, 2006).

Knowledge ecosystems are often led by independent management teams, research organizations, or universities that support innovation processes (Clarysse, 2014; Jarvi, 2018; Van der Borgh, 2012). In entrepreneurial ecosystems, government entities or universities/research organizations take on leadership roles, facilitating conditions for new venture creation (Carayannis, 2017). For instance, the University of Strasbourg in France acted as the hub organization in an entrepreneurial ecosystem, stimulating academic entrepreneurship through its Technology Transfer Office (Schaeffer & Matt, 2016).

Structure

The structure of different ecosystem types is closely tied to their respective goals, which will be discussed in the following section. Business and innovation ecosystems primarily adopt a platform structure to generate network effects, while entrepreneurial ecosystems are organized around a cluster structure to foster entrepreneurship. However, limited information is available in the literature regarding the structures of knowledge ecosystems. It is important to note that these structures are not the only ones mentioned in the literature, but they tend to be the predominant ones.

Business ecosystems typically operate on a platform structure with an orchestrator at the center, connecting complementary organizations and users (Iansiti & Levien, 2004; Kapoor & Argwal, 2017). The attractiveness of the platform to users increases as it offers a wide range of complementary services and products, leading to the creation of network effects (Katz & Shapiro, 1994). Similarly, the platform structure is prevalent in the innovation ecosystem literature (Dedehayir, 2018).

On the other hand, the cluster structure takes precedence in the entrepreneurial ecosystem literature (Auerswald & Dani, 2017). Clusters typically focus on a specific industry or technology-related knowledge base and exhibit a localized character (Delgado, Porter & Stern, 2015). The entrepreneurial ecosystem represents a specific variation of the cluster structure, characterized by spatial confinement but a broader emphasis on entrepreneurship rather than clustering within a specific industry. Nonetheless, the cluster structure is often employed in entrepreneurial ecosystems due to the belief that geographical proximity serves as a catalyst for entrepreneurship within these ecosystems (Auerswald & Dani, 2015).

Value Creation and Capture

In the ecosystem literature, different types of ecosystems exhibit distinct approaches to value creation and capture. Business ecosystems primarily focus on value capture through business model innovation, while value creation is driven by collaborative innovation processes, platform building, and role definition (Kapoor & Argwal, 2017; Clarysse, 2014; Li, 2009).

Innovation ecosystems emphasize both value creation and capture, examining mechanisms such as intellectual property rights, technology standards, business model innovation, contracts, structures, collective uncertainty management, mutual learning, shared vision development, and stakeholder engagement (Leten, 2013; Ritala, 2013).

Knowledge ecosystems focus on system-level value creation through innovation process facilitation and innovation community creation, with value capture relying on continuous business model reinvention (Van der Borgh, 2012).

Entrepreneurial ecosystems prioritize value creation mechanisms, such as designing collaborative business environments and developing entrepreneurial climates, to create a conducive entrepreneurial climate for startups and larger organizations (Clarysse, 2014).

Actors and Their Roles

In the ecosystem literature, actors within ecosystems play different roles and belong to various organization types. These roles and types of actors have implications for both micro-level interactions and macro-level goal realization of the ecosystem (Linder & Foss, 2018).

Business ecosystems categorize actors based on roles such as keystone, niche player, and dominator, and include private firms and users as actors (Kapoor & Argwal, 2017).

Innovation ecosystems also categorize actors based on roles and partner types, involving a diverse set of actors such as governments, universities, research organizations, and firms from various industries (Adner, 2006; Leten, 2013).

Knowledge and entrepreneurial ecosystems consider partner types beyond firms and users, including governmental organizations, venture capitalists, investors, and other indirect actors (Clarysse, 2014; Jarvi, 2018; Van der Borgh, 2012). These ecosystems involve collaboration among high-tech companies, governmental organizations, venture capitalists, knowledge institutions, universities, and independent orchestrators (Van der Borgh, 2012).

The roles of actors within ecosystems vary across ecosystem types, encompassing specific roles, member organization types, and partner types, reflecting the unique dynamics and goals of each ecosystem.

Coopetition

The concept of coopetition, which combines cooperation and competition, has been studied in the context of business ecosystems (Halle´n, 1991). Social exchange theory (Granovetter, 1985) provides a framework to understand relationships in business ecosystems, where exchanges between firms are viewed as dynamic processes (Halle´n, 1991).

The development of these networks involves the interlinking of activities, leveraging resource heterogeneity, and mutual benefits based on self-interest (Anderson, 1994). Bonds are

formed through exchange processes, connecting actors and influencing their relationships and identities within the network (Bernal, 2002). Actors can be sellers, buyers, organizations, or smaller groups within organizations (Turnbull, 1996), and activity links encompass various organizational activities that can be connected to those of other organizations.

In the context of coopetition, four types of coopetition models are proposed based on the work of Chin (2008):

1. Monoplayer (low competition, low cooperation): Organizations that have minimal interaction with competitors, exhibiting low levels of both competition and cooperation.
2. Contender (high competition, low cooperation): Organizations that compete fiercely with competitors for market power and share, emphasizing competition over cooperation.
3. Partner (low competition, high cooperation): Organizations that prioritize cooperation and maintain low levels of competition, seeking synergies through complementary resources and capabilities.
4. Adapter (high competition, high cooperation): Organizations that compete and cooperate simultaneously, depending on each other to achieve their respective goals.

Coopetition involves the simultaneous pursuit of cooperation and competition between firms, often through strategic alliances or joint ventures (Bengtsson & Kock, 2000; Gnyawali & Park, 2011). It is considered a win-win strategy, offering advantages such as improved quality standards, production efficiency, innovation, influencing third parties, achieving economies of scope, and setting industry standards (Gnyawali & Park, 2011). However, coopetition is a complex phenomenon that can result in a lose-lose situation if not managed effectively.

The coopetitive perspective is closely connected to business ecosystems, where rival businesses cooperate to promote a common resource or standard. Additionally, there can be coopetition between rival business ecosystems through past collaborations. While previous studies have focused on internal and external competition within business ecosystems, the dynamics of technological activities can lead to connections between ecosystems. Therefore, it is important to consider both internal and external coopetition within the context of business ecosystems (Gueguen and Torrès, 2004).

Co-evolution and Modularity

Co-evolution is the reciprocal and interdependent process of evolution among organizations within an ecosystem, involving interactions, knowledge exchange, and resource sharing (Basole, 2009; Teece, 2007; Moore, 1993). In ecosystems with distinct sub-systems and a well-defined platform architecture, co-evolution becomes evident (Li, 2009). The platform leader, as a central

actor, plays a crucial role in driving the dynamics of change by connecting the technologies of other organizations (Iansiti and Levien, 2004).

Modularity, the degree of independence and interdependence between sub-systems in the ecosystem's architectural design, influences evolution. Keystone organizations, responsible for designing the platform architectures, can increase modularity by decoupling sub-systems and standardizing interfaces (Tiwana, 2010). This allows for faster evolution of sub-systems and reduces overall complexity.

However, achieving modularity requires the establishment of stable design rules that strike a balance between stability and versatility, avoiding redundant or obsolete practices. In addition to co-evolution and modularity, the evolution of ecosystems is influenced by both endogenous and exogenous factors. Endogenous factors include the platform architecture and its hierarchical breakdown into constituent sub-systems (Tiwana, 2010). This aids in reducing interdependence and complexity within the ecosystem.

Exogenous factors, originating from the external environment, also shape ecosystem evolution. Technological changes, especially convergent ones that integrate different technologies into a single product, can create opportunities for external platform makers to enter a focal domain. This process, known as envelopment, broadens the ecosystem's scope and may lead to competition with other ecosystems.

Competitive forces from other ecosystems can impact the evolution of a focal ecosystem by attracting module developers with compatible interfaces and development tools. Tensions and conflicts may arise between platform developers and external partners who provide technologies and services to multiple ecosystems, posing governance challenges (Tiwana, 2010).

1.1.3 From value chain to business ecosystems

Gossain and G. Kandiah (1998) posit that the new business ecosystem is to some extent similar to an integrated value chain but goes beyond its scope for three main reasons. Firstly, the term "value chain" fails to capture the interconnected and symbiotic relationships between a company, its customers, suppliers, and partners. In the new ecosystem, partners collaborate to create new value for customers by seamlessly integrating their capabilities.

Secondly, the relationships between organizations, partners, and customers in the ecosystem are closely intertwined and continually evolving. This challenges the traditional economic analysis model as the boundaries between customers, suppliers, partners, information, goods, and services become blurred, impacting the supporting economies.

Lastly, authors also posit that the concept of a value chain overlooks the significance of branding. In contrast, the new business ecosystem extends the relationship to include competitors, complementors, and other partners, working together under a single brand to deliver services.

The supply chain perspective originated from the assembly line concept and gained prominence in the 1990s within operations research (Lee, 1997). Supply chains consist of actors involved in the upstream and downstream flows of inputs and outputs, ensuring efficient and responsive coordination between suppliers, distributors, retailers, and customers. The focus is primarily on managing supply-side interactions for efficiency and responsiveness, without considering demand-side complementarities and interdependencies.

As with the supply chain, when discussing ecosystems, it is essential to address the concept of value networks as well.

Stabell and Fjeldstad (1998) introduced the idea of a value network, highlighting the role of mediating technology in facilitating interactions and transactions between actors within the network. This perspective emphasizes the presence of technology tools and business processes that enable value creation. Digitalization further enhances the usefulness of value networks by aiding strategic positioning and providing insights into the entire value-creation process (Peppard and Rylander, 2006).

Value networks are typically depicted as network illustrations showcasing the companies and organizations involved in the value creation process. These illustrations demonstrate the exchange process where the end user or customer receives the final product or service, thus defining the market for the entire value network (Allee, 2000).

Business ecosystems have evolved from value networks, representing a natural progression and expansion of the conceptual space. One key addition in the ecosystem definition is the incorporation of outside network stakeholders. The ecosystem perspective embraces the stakeholder theory view. The ontology of ecosystems includes elements similar to value networks but with additional considerations such as the identification of leader companies and shared visions.

Confusion can arise when strategically assessing ecosystems and attempting to compare business ecosystems with value chains and diversification strategies. Firstly, it is important to differentiate business ecosystems from value chains and supply chains. Business ecosystems are not limited to linear sets of ascending and descending activities found in traditional systems. Instead, they represent a networked structure of organizations working together to create integrated value propositions for customers. Regarding related diversification strategy, viewing ecosystems as a strategy does not exclude the aforementioned strategy. They complement each other, allowing the expansion of the activities of a core company into other markets and the creation of additional value.

Each perspective contributes valuable insights into how firms compete and create value. For instance, Apple's iPhone success can be understood through different lenses. Apple's differentiation-based competitive advantage relies on internal activities encompassing design, R&D, marketing, manufacturing, distribution, and leadership. Additionally, Apple leverages a global supply chain to develop new iPhone generations and match supply with demand (Johnson and Mark 2017). An ecosystem perspective also plays a crucial role as Apple establishes an integrated hardware and software platform architecture, incorporating external actors such as app developers, accessory manufacturers, and service providers, to enhance the iPhone's user value proposition. The ability to leverage complementarities and manage interdependencies with external actors has been fundamental to Apple's competition and value creation (Adner, 2012).

In summary, value chains, supply chains, value networks, and business ecosystems offer different perspectives on how value is created and sustained. Value networks focus on mediating technology and collaborative interactions, while business ecosystems encompass stakeholder perspectives and shared visions. Supply chains concentrate on managing upstream and downstream flows, primarily for efficiency and responsiveness. Each of these perspectives provides unique insights into competitive strategies and value creation, highlighting the importance of considering both internal and external actors within an ecosystem framework.

1.1.4 Business ecosystem definition

The term "business ecosystem," which is applied in the context of business, emerged as a metaphor to describe new trends in the organization of market players. As the name suggests, the metaphor draws upon nature and how different species interact with each other within the laws of nature and their surrounding environment. The initial definition of this term in relation to the business environment was put forth by Moore in 1993 (Moore, 1993). The author argued that the conventional interpretation of competition and interaction within closed markets and industries is not the most optimal approach for leveraging all of a firm's resources, including its partners, suppliers, customers, and even competitors, in order to operate within a single community and compete with other ecosystems.

Throughout the lifecycle of an ecosystem, firms join forces in research and development (R&D), form joint offerings, and engage in collective actions to protect themselves from competition. This includes creating barriers to entry, defeating imitators, and defending their positions. In essence, Moore defines an ecosystem as "an economic community supported by a foundation of interacting organizations and individuals—the organisms of the business world. The economic community produces goods and services of value to customers, who are themselves members of the ecosystem" (Moore, 1993).

This approach sparked significant interest among practitioners and laid the groundwork for future research. The researcher mentioned that actors within an ecosystem exhibit varying degrees of competition and collaboration, coevolve, and develop their competencies and roles. Furthermore, the researcher emphasized that strategic analysis should move away from analyzing industries and instead focus on analyzing ecosystems (Moore, 1993).

Moore's contributions to the concept of business ecosystems also highlight the necessity of ecosystem governance, the presence of an ecosystem leader, and a shared vision. He argues that while leaders may change over time, the role itself remains crucial for aligning investments and finding mutually supportive roles among all ecosystem actors.

Building upon Moore's findings, Iansiti and Levien (2002, 2004a, 2004b) expanded the understanding of ecosystems and emphasized that a firm's success within an ecosystem depends on the overall success of the ecosystem, extending beyond the boundaries of the firm's industry. They define ecosystems as a large number of loosely interconnected participants who depend on each other for their mutual effectiveness and survival. In fact, ecosystems can bring together hundreds of organizations involved in the design, production, distribution, or implementation of even a single product (Iansiti and Levien, 2004a, 2004b).

Furthermore, these authors were the first to address the concept of roles within an ecosystem. They identify the role of a "keystone" or "hub" organization, which serves as a central element and provides the necessary conditions for other firms to ensure competitiveness and attractiveness of the ecosystem.

Based on the most significant works on ecosystems, we can present a comprehensive definition and outline the key characteristics of ecosystems. An ecosystem is a community of interconnected organizations that interact with each other through competition and collaboration to create shared value and enhance the competitiveness of both individual firms and the entire community. Participants within an ecosystem rely on each other's competencies to ensure efficiency and survival. An ecosystem-oriented organization implies that firms join forces while eschewing strict hierarchical relationships, and it thrives on attractiveness. Ecosystems are not limited to a specific industry and can bring together multiple companies from various industries.

1.1.5 Platform-based and product-based business ecosystems

Platform-based ecosystems, often referred to as transactional ecosystems, are discussed in research as creating conditions for a double-sided market, where value is generated for both customers and suppliers through a unified platform that mediates value exchange among participants (Jacobides, Cennamo & Gawer, 2018). These ecosystems revolve around a central platform architecture, which serves as a foundation for firms to offer complementary products or services

(Gawer & Cusumano, 2002). The platform owner orchestrates the ecosystem, establishing the platform's rules and governing the alignment between the platform firm and its complementors.

In contrast, in product-based ecosystems, the alignment structure between product firms and complementors is typically mutually determined (Boudreau, 2010).

In platform-based ecosystems, interactions occur in two- or multi-sided markets, where the platform firm interacts with complementors and users, resulting in cross-side network effects (Rochet & Tirole, 2006). This multi-sided market interaction shapes the alignment structure and entails pricing and subsidies by platform firms to enhance the platform's value proposition. In contrast, product-based ecosystems involve a single-sided market interaction between the product firm and the user.

Product-based ecosystems entail a single-sided market interaction between the product firm (i.e., the supplier) and the user (i.e., the buyer).

Managing interdependencies between firms and complementors in platform-based ecosystems differs significantly from those in product-based ecosystems. Platform-based ecosystems employ formal market-based governance mechanisms established by the platform firm, while product-based ecosystems utilize a combination of formal and relational governance mechanisms that can be customized for different actors. Transitioning from a product-based to a platform-based architecture requires fundamental changes in the firm's business model, capabilities, governance, and even identity (Altman & Tripsas, 2015; Van Alstyne, 2016).

Pidun and Reeves (2019) proposed two types of ecosystems: solution ecosystems, which align with product-based ecosystems, and transaction ecosystems, which align with platform-based ecosystems. These two archetypes differ in their structure, member types, purpose, success factors, and value creation mechanisms.

In a solution ecosystem, the primary goal is to develop a comprehensive solution. The core firm acts as an orchestrator, coordinating and motivating complementors' innovation activities, ensuring continuous product improvement, and ensuring fair value sharing among ecosystem members. Value is created by identifying and resolving system bottlenecks and leveraging supermodular complementarities. Solution ecosystems typically monetize the value they create by selling their solution as a product or service (Pidun & Reeves, 2019).

On the other hand, a transaction ecosystem focuses on matchmaking, finding the best fit between customer needs and producer offerings and facilitating transactions. Value creation in a transaction ecosystem depends on the number and benefits of successful transactions. The platform orchestrator plays a vital role in managing platform access, establishing standards and rules, and incentivizing participants to drive ecosystem growth and exploit network effects. Monetization in

transaction ecosystems often involves transaction fees or advertising charges (Pidun & Reeves, 2019).

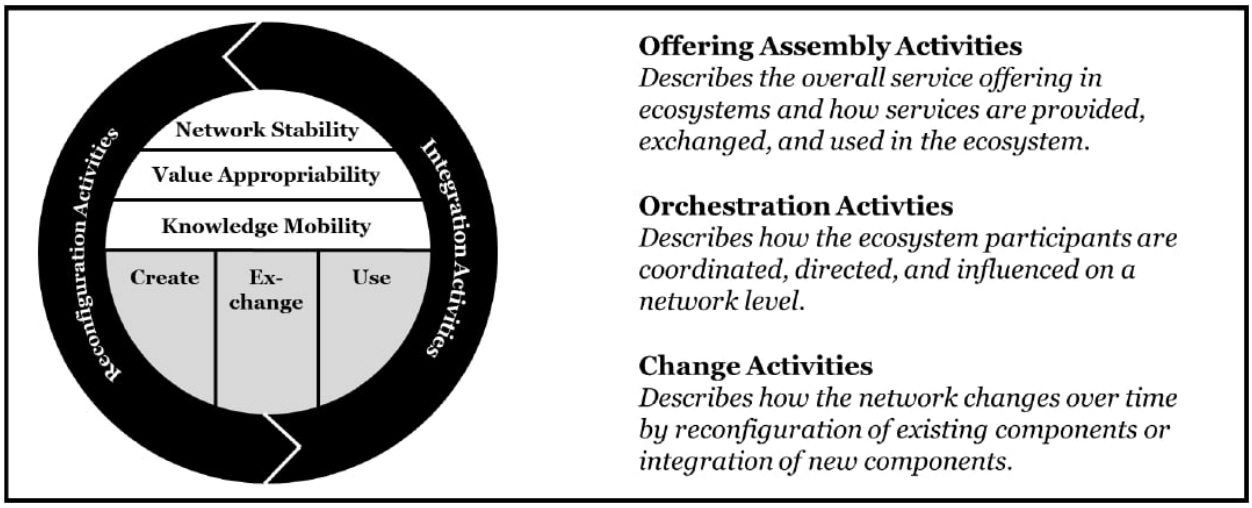
For the purposes of this study, we will focus on the interaction between the customer and the digital ecosystem. Specifically, we will examine a single-sided market ecosystem, corresponding to the product-based ecosystem defined by Rahul Kapoor, and the solution-based ecosystem defined by the Boston Consulting Group (Pidun & Reeves, 2019; Kapoor, 2018).

1.1.6 Integrated value proposition and complementarities

The proposed conceptual model by Betz & Jung (2021) focuses on value creation within ecosystems and emphasizes the importance of complementarities and the process of creating an integrated value proposition. This model provides a three-level description of distinct value creation process components.

Figure 1.1.

Ecosystem value sphere (Betz&Jung, 2021)



The first level in the model is assembly activities, which highlight how individual actors within the ecosystem contribute to the overall offering. This recognizes the diverse roles and contributions of different actors within the ecosystem and how they come together to create value.

The second level is orchestration, which describes how these activities are coordinated towards a shared purpose by the orchestrator. The orchestrator plays a crucial role in managing and directing the interactions and collaborations within the ecosystem to ensure that the value creation process is efficient and effective.

The third level involves activities related to coevolution and change of the network and configuration over time. This recognizes that ecosystems are dynamic and constantly evolving. The model proposes a sub-activity view where the ecosystem is continuously reconfigured, and new

elements are integrated within it. This flexibility and adaptability are essential for the ecosystem to respond to changes and seize new opportunities.

In terms of value chain components, the authors introduce a network and customer-centric perspective. They emphasize not only how the service or offering should be created but also how the benefits should be exchanged throughout the network. Additionally, the authors highlight the final beneficiary in the form of the customer (Use). This customer-centric approach ensures that the value created within the ecosystem ultimately reaches and benefits the end-user.

Furthermore, the model introduces additional views in the orchestration activities. The ecosystem orchestrator is responsible for ensuring knowledge mobility, which complements knowledge ecosystems. They also focus on value appropriability, which complements innovation ecosystems. Lastly, network stability is highlighted as a critical activity to maintain the stability and sustainability of the ecosystem.

Overall, the model proposes a holistic and comprehensive framework for understanding value creation in business ecosystems. It acknowledges the interdependence and collaboration among multiple entities within the ecosystem, emphasizing the importance of complementarities and the dynamic nature of ecosystems. By considering these factors, the model aims to facilitate the emergence of an integrated value proposition within the ecosystem.

In various industries, the nature of competitive advantage has shifted away from standalone products and services towards integrated value propositions that are built upon an ecosystem of interdependent products from multiple independent firms (Adner, 2017; Kapoor, 2018). Ecosystems provide a structure for coordinating participating firms to realize value propositions that rely on unique and non-generic complementarities (Jacobides, Cennamo, & Gawer, 2018). As a result, emerging ecosystems have the potential to disrupt the competitive positions of firms that focus solely on individual products, compelling them to adapt (Ansari, Garud, & Kumaraswamy, 2016; Jacobides, Macduffie, & Tae, 2015).

Complementors play a crucial role in an ecosystem as they produce complementary products and services that contribute to the value creation of the focal offer. Unlike the relationship between firms and their suppliers, the interdependence between firms and complementors follows a distinct pattern. Suppliers have a supply-side sequential interdependence, where the firm holds decision rights over the integration of upstream inputs into the focal offer. On the other hand, complementors have a demand-side pooled interdependence, where the downstream actor or user holds decision rights over the integration of complements with the focal offer (Jacobides, 2018).

When dealing with suppliers, firms focus on establishing a dyadic governance structure, utilizing formal and relational mechanisms, to effectively coordinate activities. However, with

complementors, the primary consideration is to create an "alignment structure." This multilateral structure, aiming for joint-value creation and conflict mitigation over time, goes beyond coordination mechanisms. It also involves mutual agreement on interoperability standards, business models, and the distribution of value within the integrated bundle of the focal offer and its complements (Jacobides, 2018).

The function performed by a complement can vary in terms of its contribution to the value proposition of the focal offer. Some complements have no standalone value, but create value only when used jointly with the focal offer, as seen in examples like razor and blade or mobile phone and mobile operating system, referred to as strong or strict complementarity. Alternatively, complements can exhibit supermodular complementarity, where increased performance, cost, or availability of the complement enhances the value proposition of the focal offer. Complements can also be categorized as generic or specialized with respect to the focal offer, which significantly impacts the challenges firms face in creating an alignment structure and realizing the value proposition (Jacobides, 2018).

Firms typically have well-defined internal organizational designs to manage buyer-supplier relationships through procurement, marketing, and sales functions. However, in ecosystems involving complementors, firms neither buy from nor sell to complementors. Instead, they coordinate activities with complementors, involving both upstream activities like R&D and downstream activities like marketing. This increases the complexity of organizational design as firms need to effectively manage their interdependence over time. Managing complementors presents an important organization design challenge, requiring well-defined interfaces and processes (Kapoor 2014).

Furthermore, Fragidis, Koumpis, and Tarabanis (2007) highlight the suitability of business ecosystems for developing customer-centric business models that offer utility, significant outcomes, and valuable experiences to customers based on a view of the ecosystem of customer needs. (Gossain & Kandiah, 2018; Fragidis, Koumpis, & Tarabanis, 2007).

In many cases, a single business ecosystem is unable to meet all customer requirements related to a specific need. Fragidis, Koumpis, & Tarabanis (2007) show this on the example of Ford and General Motors, where customer needs associated with purchasing a new car, such as recycling the old one, obtaining a car license, and acquiring insurance, are not adequately addressed. Customer needs become even more complex when considering factors like loans and selling the old car.

Thus, a customer-centric business ecosystem is formed around the outcomes that the clients need from performing some activities and satisfying particular needs. Therefore, the complements in business ecosystem are evolved around some particular need (e.g. delivery, transportation, information, social activities, navigation) comprising interconnected business ecosystems and individual entities that revolve around them. (Gossain & Kandiah, 2018).

1.1.7 Summary on business ecosystems theory overview

The concept of ecosystems has gained recognition across various domains, including business, innovation, knowledge, and entrepreneurship. While each type of ecosystem has its specific focus, they share common features that contribute to sustainable innovation.

In the business context, the concept of a "business ecosystem" emerged as a metaphor to describe the changing dynamics of market players. It emphasizes collaboration and competition among interconnected organizations to create shared value and enhance competitiveness. Business ecosystems bring together companies from different industries, leveraging each other's strengths and competencies for efficiency and long-term survival.

Key features of ecosystems include orchestration, structure, value creation and capture, actors and their roles, coopetition, co-evolution, and modularity. These elements shape the functioning and dynamics of ecosystems, varying across different types such as business, innovation, knowledge, and entrepreneurial ecosystems.

The business ecosystem concept expands on the traditional value chain by emphasizing collaborative relationships and fluid boundaries between industries and focus on value proposition on demand-side. In contrast, supply chains primarily focus on managing upstream and downstream activities flow for efficiency and responsiveness and focus on supply-side.

Ecosystems can be categorized into different types, such as platform-based ecosystems and product-based ecosystems. Platform-based ecosystems involve multi-sided markets and cross-side network effects, requiring formal market-based governance mechanisms to manage interdependencies between firms and complementors. On the other hand, product-based (solution) ecosystems focus on comprehensive solutions that allows integrated value proposition as a sum of values of all services to evoke. The focus of this work is on single-sided product-based ecosystems.

In today's competitive landscape, value creation has shifted from standalone products to integrated value propositions built upon ecosystems of interdependent products. Complementors, who provide complementary products and services, play a crucial role in the ecosystem. Firms must establish an "alignment structure" to effectively coordinate activities and create joint value with complementors. The function of a complement can vary, from strong complementarity where value is created when used jointly with the focal offer, to supermodular complementarity where the complement enhances the value proposition.

Business ecosystems aim to create value by offering a wide range of information, services, and products to customers. They are suitable for developing customer-centric business models that cater to customers' utility, outcomes, and experiences. The perception of value by customers depends on the integrated value proposition within the ecosystem and is evaluated based on their desired

outcomes. Aligning complementors within the ecosystem is crucial in evoking the integrated value proposition that customers perceive as value of ecosystem offering.

Furthermore, it is important to evaluate the contribution of each complementor in shaping outcomes for the client. Therefore, we propose that business ecosystems should maximize the perceived value of their services by understanding how customers perceive value and the extent to which each complement contributes to the overall ecosystem value. Based on this information, business ecosystems can invite new partners and create new entities and functions not only based on monetary contribution and capability view but also from a value proposition perspective.

1.2. Overview of Theory of Consumption Value

1.2.1 Relevant theories for intention to use

The theory that will be used in order to capture the value that ecosystems create from the standpoint of customers is the theory of consumption values (Sheth, 1991), before addressing it directly, let us compare it with several relevant theories in consumer behavior studies that can be alternative for the purposed of our study.

In the field of consumer behavior, several relevant theories can be assessed with the Theory of Consumption Values (TCV) to better understand the motivation behind buying behavior. One such theory is Schwartz's values theory, which identifies 10 basic values observed across cultures and their dynamic relations (Schwartz, 1992, 2012). While Schwartz's theory focuses on personal-based values, the TCV focuses on values related to the consumption of products, product categories, and brands. Both theories offer theoretical insights into buying behavior through the lens of values (Schwartz, 1992; Schwartz, 2012).

Another theory that contributes to understanding consumer motivation is the organismic integration theory within psychology, a sub-theory of self-determination theory (Deci & Ryan, 1985; Gilal, 2019). This theory explores the role of extrinsic motivation and the perception of locus of causality in consumer behavior. The theory suggests that external motivation is determined by various forms of regulation, which can influence behaviors such as green behavior and brand passion (Gilal, Chandani,, 2020). While the organismic integration theory focuses on a regulation-oriented approach to motivation, the TCV examines motivation through a perceived value perspective.

The Technology Acceptance Model (TAM) is another prominent framework used to study innovation adoption, particularly in the context of m-banking (Shaikh & Karjaluoto, 2015). TAM, initially developed by Davis (1989) and based on the theory of reasoned action (Fishbein & Ajzen, 1975), focuses on perceived usefulness and perceived ease of use as predictors of attitudes and usage intention toward technology. TAM has been extended over time, leading to models like TAM 2 and

TAM 3, as well as the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh & Davis, 2000; Venkatesh & Bala, 2008; Venkatesh, 2003). While TAM primarily examines utilitarian value in organizational settings, the TCV offers a broader perspective by considering consumption values related to products, categories, and brands.

The UTAUT was introduced by Venkatesh, Morris, Davis, and Davis (2003). The UTAUT model combines aspects from eight user acceptance models and identifies four main factors that determine the intention and behavior of technology usage: performance expectations, ease of use expectations, social influence, and facilitating conditions. The model takes into account personal factors such as gender, age, experience, and willingness to use, which influence how the main factors affect the intention and behavior of using the product.

According to Venkatesh (2003), the UTAUT model is more effective than other models in explaining technology acceptance behavior, accounting for 70% of it. Other models, on the other hand, only explained between 17% and 53% of behavioral intention-to-use. The UTAUT model is a fundamental framework that directs future research in the area of Information Systems adoption.

The UTAUT model has been validated and adapted in various contexts through multiple studies. Hung (2007) employed the UTAUT model to examine the adoption of electronic services and validated the findings of the original UTAUT model. Schaper and Pervan (2007) revised the UTAUT model by including three aspects of technology acceptance, namely individual, technology, and implementation. The study showed that intention to use was affected by effort expectancy and compatibility, but not by social influence and performance expectancy. This is different from previous research, which emphasized the importance of social influence and performance expectancy as determinants of intention-to-use (Hung, 2007; Venkatesh, 2003).

In contrast, Al-Gahtani, Hubona, and Wang (2007) adapted the UTAUT model by replacing the concept of social influence with subjective norms. Their study found that both performance expectancy and subjective norms had a positive influence on the intention-to-use desktop computer applications, while effort expectancy and facilitating conditions had no significant effects.

In addition to these theories, there have been expansions and adaptations of value-based models in the literature. For example, the Perceived Value Model (PERVAL) developed by Sweeney and Soutar (2001) incorporates functional, emotional, social, and monetary dimensions of consumption values. Similarly, Petrick (2002) introduced the Perceived Value of a Service Model (SERVPERVAL) with dimensions such as quality, emotional response, monetary price, behavioral price, and reputation. Further extensions of the TCV include the Global Value (GLOVAL) model by Sanchez (2006).

1.2.2 Perceived value

Perceived value is the assessment made by consumers regarding the advantages and drawbacks of a marketing offer in comparison to competing offers (Kotler & Armstrong, 2014). In the literature, there are two main approaches to studying perceived value. The first approach, rooted in economic theory and utility, takes a unidimensional perspective. According to this approach, consumer choice behavior is driven by utility maximization, and perceived value is seen as a tradeoff between benefits and sacrifices (Hallem & Barth, 2011). Zeithaml (1988) provides a commonly accepted definition of perceived value as "the consumer's overall evaluation of the product's utility based on perceptions of what is received and what is given." Value, as defined by Zeithaml (1988), involves a tradeoff between salient components of giving and getting. However, this simplistic approach has been criticized for its limited ability to explain the complex nature of perceived value (Hallem & Barth, 2011).

The second approach explores perceived value from a multidimensional perspective, which better captures its complex nature. Several researchers (Holbrook, 1999, 2006; Sheth, 1991; Sweeney & Southar, 2001) have proposed different dimensions to investigate perceived value. Sinha and Desarbo (1998) introduced a multidimensional structural view of perceived value, incorporating factors such as price, quality, utility, and sacrifice. Holbrook (1999) suggested a typology of values in consumption experiences, including efficiency, excellence, status, esteem, play, aesthetics, ethics, and spirituality. Holbrook (2006) further expanded on customer value typology by combining extrinsic versus intrinsic values and self-oriented versus other-oriented values, encompassing economic, social, hedonic, and altruistic values. Sweeney and Soutar (2001) identified emotional, social, quality, and price values as dimensions of consumption value, based on the PERVAL scale constructed on utilitarian and hedonic foundations within this approach.

1.2.3 Theory of Consumption Value and consumer behavior

The Theory of Consumption Value (TCV) has become a prominent framework for studying perceived value among consumers due to its multi-dimensional approach that encompasses both utilitarian and hedonic aspects (Sheth, 1991). The TCV, introduced by Sheth (1991) in their article "Why we buy what we buy: A theory of consumption values" published in the Journal of Business Research, has garnered significant attention with 6456 citations in Google Scholar (as of May 2023).

This theory provides insights into the motivations behind consumption behavior by predicting, describing, and explaining consumer choice behavior through the lens of consumption values. Drawing from disciplines such as economics, marketing, consumer behavior, sociology, and psychology, the TCV offers a multidisciplinary perspective for studying consumer decision-making (Sheth, 1991). It is important to note that the practical scope of the theory is limited to individual,

systematic, and voluntary decision-making, while not covering other contexts such as group decisions or involuntary choices.

The TCV addresses several key questions posed by Sheth (1991. p. 159), including why consumers choose to buy or not buy a specific product, why they choose one type over another, and why they prefer one brand over another. To answer these questions, the TCV proposes five consumption values: functional value, conditional value, emotional value, social value, and epistemic value. Consumption value refers to the extent to which a product meets consumers' needs and generates net utility or satisfaction after purchase (Biswas & Roy, 2015).

The TCV is built upon three main propositions (Sheth, 1991. p. 160):

1. Consumer choice is influenced by multiple consumption values.
2. Different consumption values have varying impacts on decision-making.
3. Consumption values are independent of each other.

Author also provides detailed definitions of the proposed consumption values in the TCV. Functional value pertains to the perceived utility derived from a product's functional or utilitarian performance. Social value relates to the perceived utility associated with a product's connection to specific social groups. Emotional value refers to the perceived utility stemming from a product's ability to evoke feelings or affective states. Epistemic value involves the perceived utility derived from a product's ability to spark curiosity, provide novelty, or satisfy a desire for knowledge. Conditional value encompasses the perceived utility acquired by a product in specific situations or circumstances.

The TCV has been tested in over 200 consumer choice contexts, ranging from the decision to use food stamps or cocaine to product types such as automobiles and brand selection like toothpaste and automobiles (Sheth, 1991). As a result, Sheth (1991) suggest that the TCV can be applied to study consumer choice behavior across various product categories, including durable and non-durable goods and services. This claim is supported by studies in different contexts within consumer behavior literature, including the digital environment.

TCV laid the foundation for a consensus among several researchers to support the notion of a multi-dimensional concept of value. Multi-dimensional value refers to the combined evaluation of various dimensions of value perceived by consumers (Zeithaml, 1988). This perspective recognizes that values possess multiple dimensions rather than being singular, owing to their intangible, intrinsic, and emotional characteristics (Woodruff & Gardial, 1996).

Among the fundamental dimensions of the multi-dimensional value concept, the utilitarian and hedonic dimensions hold significance (Woodruff & Gardial, 1996). The utilitarian dimension pertains to instrumental, task-related, rational, and functional aspects, including price savings,

service excellence, and time savings (Babin, 1994; Sweeney & Soutar, 2001). On the other hand, the hedonic dimension encompasses emotional and entertainment value, characterized by noninstrumental, experiential, affective, and entertainment-related elements (Babin, 1994; Sweeney & Soutar, 2001). Both forms of value have an impact on outcomes such as consumer satisfaction (Sweeney & Soutar, 2001) and purchase behavior (Oliver, 1996).

Further research has expanded upon the concept and dimensions of value. One proposal defines value as an interactive relativistic preference experience that characterizes an individual's interaction with an object. It suggests that value consists of eight dimensions: efficiency, excellence, politics, esteem, play, aesthetics, morality, and spirituality (Holbrook, 1994).

Additionally, in line with this multi-dimensional perspective, five value dimensions—functional, emotional, social, epistemic, and conditional—were proposed as the motivations behind consumers' decisions to utilize products or services (Sheth, 1991).

In recent studies, scholars have applied the Theory of Consumption Values (TCV) framework to various contexts, including online products, services, and the hospitality sector, to gain a deeper understanding of the association between consumers' intentions and consumption values (Peng, 2019; Williams, 2017; Yang & Mattila, 2016; Kaur, 2018; Mäntymäki & Salo, 2015). Peng (2019) employed the TCV to investigate how perceived functional, hedonic, and symbolic/expressive values impact customers' contentment with restaurants at travel destinations, and how this, in turn, affects their attitudes and intentions towards the destination.

In 2017, Williams conducted a study on adventure tourists from different cultures to examine how customer value, satisfaction, and behavioral intentions are related. The study found that tourists from Japan and Western countries placed different levels of importance on novelty, emotional values, and price value. According to Yang and Mattila's (2016) research, consumers' intentions towards luxury restaurants are influenced by three values: hedonic, functional, and financial.

Kaur (2018) discovered that social and emotional values had a partial impact on the sustained use of online social media brand communities. Mäntymäki and Salo (2015) found that social and emotional values were the primary factors that influenced teenagers' expenditure of actual money in virtual worlds. These studies highlight the importance of the Theory of Consumption Values (TCV) framework in comprehending consumer decision-making regarding digital business ecosystem services. This supports the framework's use in our research.

The Theory of Consumption Value (TCV) is a highly regarded theoretical approach in the technology adoption field, known for its valuable contributions when compared to other approaches like TAM, TPB, and TRA. According to Hedman and Gimpel (2010), the TCV model provides a more thorough comprehension of consumer behavior and has greater explanatory capability than the

TAM model. Wen and Noor (2015) discovered that the TCV is more effective in explaining the purchase of hybrid cars than the theory of planned behavior and the theory of reasoned action.

The rationale for selecting TCV for this study is as follows. Firstly, the utilization of DBE services reflects consumer behavior in the presence of alternatives, and TCV is a frequently employed theory in research for this objective. This technique has been employed to examine the behavior of consumers when it comes to selecting eco-friendly products (Lin and Huang, 2012) and mobile devices (Bødker, 2009). The TCV provides a reliable approach to comprehend consumer behavior by integrating traditional perspectives on value in consumer-behavior studies.

Furthermore, researchers have effectively applied the TCV model in the online environment to gain understanding of the benefits received by customers in virtual and digital realms (Kaur, 2018; Mäntymäki and Salo, 2015).

We utilized the TCV to contribute to the ongoing research on consumer behavior within digital business ecosystems. This region is receiving significant attention, and there has been a recent shift in research focus towards integrated value propositions (Ho and Bodoff, 2014). The investigation of why customers favor one ecosystem over another and the benefits they receive is insufficiently studied in the realm of electronic services in digital business ecosystems. Therefore, it is logical to assume that the Theory of Consumption Values (TCV) can be applied to comprehend the perceived value in the context of digital business ecosystems (DBE).

Despite the criticism, we will use the TCV theory in our current study as it has been proven reliable and applied to various contexts. In the following section, we will evaluate the necessary value dimensions for assessing DBE.

Usefulness value

According to the assertion, customers assess the significance and attractiveness of a product by considering how its features correspond to the specific outcomes of using the product. The term "usefulness value" refers to the perceived benefit obtained from a product's ability to perform functional, utilitarian, or physical tasks. An alternative becomes useful by having important functional, practical, or physical characteristics. According to Sheth (1991), functional value is evaluated based on a set of preferred characteristics.

The constructs of perceived usefulness and perceived capability of a product have been analyzed in various models, such as the Technology Acceptance Model (TAM). Davis (1989). Thus, it has a significant impact on the consumer's purchase intention or usage intention.

Hedonic value

The impact of hedonic and utilitarian attributes on consumer attitudes and behavior has been widely studied. Several studies have indicated that people's emotional attitudes are typically

associated with hedonic aspects of consumption, while their rational attitudes are linked to utilitarian aspects (Alba & Williams, 2013).

The term "hedonic value" pertains to the positive emotions such as pleasure, comfort, safety, and relaxation that arise from the use of a specific brand. The pleasure that a product provides can make it more appealing to consumers and affect how they perceive its qualities and whether it meets their expectations. This is known as product personality attraction. According to Ekawati (2021), the positive effect of hedonic value on consumers' behavioral intentions is well-established. Additionally, hedonic value contributes to the overall consumption value of a product or service.

Social value

Consumer satisfaction and behavior are influenced by the perceived social value (Keshavarz, 2018). Some studies suggest that certain products create a feeling of belonging, while others are associated with higher social status. Several studies have shown that there is a positive correlation between how much value a customer perceives in a product or service and their likelihood to take action, as stated by Kervenoael in 2020. Research conducted earlier has indicated that the social value of green products can have a direct impact on consumers' intention to purchase them (Chen & Zhang, 2021). Jaleel (2021) conducted a study to examine the correlation between consumers' perceived value and behavioral intention in medical tourism services. The findings revealed that perceived social influence and social value significantly influenced usage intention.

Novelty value

Also known as epistemic value, refers to the degree to which a product satisfies a customer's curiosity and provides them with new knowledge or information. According to Fazal-e-Hasan (2021), the utilization of novel features can considerably enhance the likelihood of consumers adopting intelligent retail technology. According to certain scholars, consumers desire novel service experiences that offer distinct functionalities from their predecessors. According to Truong (2020), meeting customers' expectations of exploration and learning can lead to an increase in their usage intentions. Adapa's (2020) recent study found a positive relationship between perceived novelty and usage intention.

According to Jordan (2008), social value pertains to the emotional contentment, self-regard, self-worth, and feeling of inclusion that customers experience from a particular service or application.

Consumption value and intention to use

Consumption value encompasses multiple dimensions, including usefulness value, hedonic value, novelty value, and social value. Previous studies have examined the influence of these value dimensions on the adoption of new products (Hur, 2012). Lin (2005) emphasized that consumption

value is a comprehensive assessment that consists of various dimensions, with each component value contributing to consumers' overall value assessment to varying degrees.

The adoption of a multifaceted construct like consumption value occurs when it serves as a convenient summary of subsidiary tendencies that contribute to it. This approach assumes that the whole construct is more meaningful than any specific part or the sum of its parts (Carver, 1989; Vij & Walker, 2016). Therefore, we propose that the multidimensional construct of consumption value better explains the intention to use business ecosystem services compared to considering the separate values individually. Based on this approach, our first hypothesis is as follows:

H1: *The four constructs (UV, SV, HV, and NV) represent distinctive facets of consumption value (CV) of digital business ecosystem;*.

H1a: *Usefulness value (UV) is a distinctive measure of consumption value (CV);*

H1b: *Hedonic value (HV) is a distinctive measure of consumption value (CV);*

H1c: *Social value (SV) is a distinctive measure of consumption value (CV);*

H1d: *Novelty value (NV) is a distinctive measure of consumption value (CV).*

Intention to use is a variable that measures a consumer's planned future use of a particular product or service (Ajzen & Fishbein, 1980). The Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) and the Technology Acceptance Model (TAM) (Davis, 1989) are theoretical models that explain the relationship between intention to use and usage behavior. These models propose that intention to use is influenced by factors such as perceived usefulness, perceived ease of use, attitude, subjective norm, and behavioral control.

Previous research has shown that intention to use is a significant predictor of actual usage behavior in various contexts, including e-commerce, mobile banking, and social networking sites (Agarwal & Karahanna, 2000; Lin, 2011). For example, Agarwal and Karahanna (2000) found that intention to use significantly predicts online shopping behavior, with a stronger effect than perceived usefulness. Considering the value-related factors in the Theory of Consumption Values (TCV), it is important to assess their influence on intention to use (Hedman & Gimpel, 2010).

In this study, we aim to validate these inferences and apply them to the context of ecosystems. Therefore, we propose the following hypothesis regarding the relationship between consumption value and intention to use new services within the Yandex ecosystem:

H2: *Consumption value (CV) positively influences the intention to use new services of the Yandex ecosystem (IU).*

Additionally, since there are different conceptualizations of CV in the literature, with some studies treating it as a unidimensional construct and others as a multidimensional construct, it is necessary to validate this concept within the new context and determine whether the evaluation of

an ecosystem's integrated offering differs from the evaluation of separate services. Hence, we intend to compare first-order and second-order models:

H3: *The second-order CV model exhibits greater explanatory power for intention to use new services of digital business ecosystem compared to the first-order model.*

1.3 Domain-Specific innovativeness and generation Z consumption

1.3.1 Overview of Domain-Specific Innovativeness

Consumer perception, attitudes, and behaviors toward new products vary among individuals, with some readily adopting innovations while others perceive them as risky and ambiguous (Bhatnagar, 2000). The level of innovation adoption also differs among individuals, with some showing a greater tendency toward adopting new technologies, while others follow the lead of innovative individuals and adopt innovations later (Limayen, 2000).

Consumers who quickly adopt innovations are referred to as innovative consumers and are willing to pay a higher price for new products (Kotler, 1997). These consumers also provide feedback on new products and play a crucial role in spreading innovations through word-of-mouth communication. Consumer innovativeness is linked to consumer behaviors and characteristics, as innovative consumers are more prone to risk-taking, more socially connected, opinion leaders, possess domain-specific knowledge about new products, and intensively use products in that category (Goldsmith, 1987, 2003).

Consumer innovativeness can be examined at both innate and domain-specific levels. At the innate level, innovativeness is influenced by individual characteristics, such as risk-taking tendencies and avoidance of ambiguity (Lee, 2007; Bayat, 2003). Individuals with higher self-esteem are also more inclined toward risk-taking and, therefore, tend to exhibit greater innovativeness (Bayat, 2003).

At the domain-specific level, consumer innovativeness is influenced by consumers' perceptions, attitudes, and characteristics related to specific product domains. Factors such as domain-specific opinion leadership, expertise, and the social identity function of a product contribute to domain-specific innovativeness (Myers and Robertson, 1972; Grewal, 2000).

Consumer innovativeness refers to the tendency of consumers to purchase new products more frequently and earlier than others (Midgley and Dowling, 1978). However, the construct of innovativeness is broad and subject to debate in the marketing literature (Roehrich, 2004). Two fundamental approaches to consumer innovativeness are evident in the literature. The first approach considers innovativeness as an innate characteristic, reflecting an individual's openness to new opinions and independent innovation (Midgley and Dowling, 1978). The second approach, domain-

specific innovativeness (DSI), focuses on consumers' innovative behavior within specific product categories while acknowledging that they may be followers in other categories (Grewal, 2000).

The domain-specific innovativeness approach aims to explain individual behavior within specific product categories and is considered critical for understanding innovation adoption (Goldsmith and Flynn, 1992). It explores the interaction between individual characteristics and interest in a specific product category, influencing the tendency toward acquiring new products in that category (Roehrich, 2002). Innate innovativeness is expected to affect domain-specific innovativeness, as personal characteristics play a significant role in shaping attitudes and behaviors.

Moreover, research has also suggested that consumption value (i.e., utility, hedonic, and social value) plays a mediating role in the relationship between innovativeness and intention to use. For example, Park (2007) found that hedonic value mediates the effect of perceived innovativeness on online game adoption intention. Similarly, Lee and Park (2008) found that social value mediates the effect of perceived innovativeness on social media adoption intention.

1.3.2 Generation Z: innovativeness and digital addiction

Definition and characteristics

Generation Z, also known as Gen Z, refers to the young adults born in 1995 or later (Bassiouni & Hackley, 2014). They are characterized as the most ethnically diverse and technologically sophisticated generation. Gen Z is known for their informal, individual, and direct style of communication, with social networking playing a crucial role in their lives. They have a Do-It-Yourself mindset and are often described as entrepreneurial, trustworthy, and tolerant (Schawbel, 2014).

Compared to Generation Y, Gen Z is less motivated by money and more realistic about their work expectations, while also maintaining optimism about the future (Schawbel, 2014). However, they are often associated with characteristics such as impatience, instant-mindedness, and a high dependency on technology with a low attention span. They are seen as individualistic, self-directed, demanding, materialistic, and entitled.

Generation Z also displays a strong concern for environmental issues and a high sense of responsibility towards natural resources (Mihelich, 2013). They are eager to be heard and are deeply connected to technology, although they may lack problem-solving skills and the ability to analyze situations and make decisions (Slavin, 2015).

While Gen Z is highly educated, technologically savvy, and innovative, they are also known for their different behaviors and attitudes compared to previous generations, which can lead to changes in consumer behavior (Schlossberg, 2016). They are heavy users of technology and see it as an instrument for their daily live (Van den Bergh & Behrer, 2016).

It is important for marketers and businesses to understand the characteristics and preferences of Generation Z to effectively engage with this generation and cater to their unique needs and expectations (Bernstein, 2015). End especially bringing up the concept of Generation Z allows us to evaluate how their tech-related attitudes and resulting innovativeness affects the intention to use new e-services and shapes the perceived value of digital business ecosystem.

Innovativeness of Gen Z

Generation Z, as consumers, exhibit several characteristics that highlight their innovativeness and unique expectations. Wood (2013) identifies four trends that define Generation Z as consumers, including their interest in new technologies, insistence on ease of use, desire to feel safe, and the need for temporary escape from reality. This generation has grown up amidst significant political, social, technological, and economic changes, shaping their perspectives and expectations.

In the retail sector, Generation Z consumers have higher expectations, display less brand loyalty, and prioritize the overall experience (Schlossberg, 2016). They expect retailers to adapt and find new ways to capture and retain their attention. This consumer behavior emphasizes the need for innovation and the development of novel strategies to engage and cater to the preferences of Generation Z.

Furthermore, Generation Z is known for their comfort and familiarity with technology, particularly their extensive use of social media platforms for socializing and communication (Yadav & Rai, 2017). They have grown up with ready access to the internet and have been exposed to a significant amount of technology throughout their upbringing (Brosdahl & Carpenter, 2011). Gen Z's reliance on technology for social interactions and the strong virtual bonds they form through social media platforms contribute to their unique behavior and preferences.

Generation Z's innovative nature, affinity for technology, and distinct consumer behavior highlight the importance of recognizing and evolving product/service offerings that cater to their expectations and preferences (Priporas, 2017).

Based on the outline literature, a hypothesis can be proposed that product innovativeness has a positive influence on intention to use, such that higher product innovativeness leads to higher intention to use. Additionally, a hypothesis can be proposed that consumption value (i.e., utility, hedonic, and social value) mediates the relationship between product innovativeness and intention to use, such that the effect of product innovativeness on intention to use is partly explained by the perceived value of the product or service.

H4: *Product innovativeness in IT domain (PIIT) positively influence intention to use new services of digital business ecosystem (IU);*

H5: *Consumption value (CV) mediates the effect of innovativeness on intention to use new services of digital business ecosystem (IU).*

Digital addiction

Generation Z, also known as the i-generation or Internet generation, heavily relies on digital devices for various purposes and considers them indispensable tools in their lives (Leena, Tomi & Arja, 2005). They use digital devices for communication, entertainment, multitasking, and accessing online platforms such as social media (Adıguzel, Batur & Eksili, 2014). Gen Z is known for being tech-savvy and having the ability to navigate and communicate in the digital realm (Adıguzel & Batur & Eksili, 2014).

However, the extensive usage of digital devices among Gen Z has raised concerns about addiction-like behavior or impulsive disorder (Ozkan & Solmaz, 2015). Digital Device Addiction (DDA) is characterized by impulsivity and materialism, which can lead to alienation from society (Jones, 2014). While it is challenging to classify DDA as a pathological disorder, the addictive and habit-forming nature of digital devices is evident among Gen Z (Ozkan & Solmaz, 2015).

Studies by Sheopuri and (2014) support the notion of excessive usage and behavioral disorders associated with the use of digital devices, particularly among youth. The attraction to digital devices and the inclination to follow fashion trends and styles contribute to the tech-savviness of Gen Z, but also raise concerns about certain behavioral disorders (Goswami & Singh, 2016).

The addictive behavior related to smartphone use is found to be higher among Generation Z compared to other generations, as emotional gains from smartphone use are significantly higher for this generation (Zhitomirsky-Geffet & Blau, 2016). This suggests that Gen Z individuals derive a higher level of satisfaction and attachment from their smartphone use, potentially indicating addictive tendencies.

The detrimental effects of excessive digital device usage, including radiation-related concerns and symptoms such as headaches, decreased concentration, and local irritation, further emphasize the need to address the potential risks associated with Gen Z's dependence on digital devices (Zhitomirsky-Geffet & Blau, 2016).

Therefore a hypothesis can be proposed in order to assess the moderating effect of digital addiction on effect of consumption value on intention to use:

H6: Digital addiction moderates the effect of consumption value on intention to use new ecosystem services.

1.4 Overview of ecosystems in Russia

1.4.1 Recent studies on DBE in Russia

Digital ecosystems in Russia have gained popularity in recent years, with various companies and organizations focusing on creating and developing their own ecosystems. Researchers and analysts have studied the key elements and success factors for creating digital ecosystems in business.

In her 2020 review, Ekaterina Stolyarova discussed the essential components of creating a digital ecosystem and identified various factors that contribute to its success. These factors include selecting appropriate services, promoting innovation within the technology platform, having a comprehensive technology platform, establishing a clear plan for creation and development, expediting the platform's creation, utilizing creative approaches, and having the necessary competencies within the company. Stolyarova conducted an analysis of the ecosystems of Sber, MTS, Yandex, Alibaba, Amazon, and Tencent, with a primary emphasis on their service availability.

Bykanova, Gordya, and Ten (2020) analyzed how Russian banks transformed into digital ecosystems. They examined the ecosystem creation processes in Sber, VTB, Tinkoff, and Alfa-bank. The authors analyzed different services and platforms within these ecosystems and categorized them into 15 major directions. They emphasized the need for further research on digital ecosystems in Russia.

Malyavkina and Savina focused on the financial sector as the primary ecosystem creators. They analyzed the digital transformations of Sber, VTB, Gazprombank, and Rosselkhozbank. The authors highlighted the role of original banking services as the basis for ecosystem development and the expansion of product lines beyond traditional banking services. They proposed a model of a modern digital ecosystem in financial companies.

Bubnova (2020) proposed various digital ecosystem models for banks, such as aligning the banking infrastructure with the customer's lifestyle, establishing a marketplace, consolidating banks, and merging banks with other financial entities. Vakhrushev, Kalsin, and Niederstrat (2020) have identified three comparable models: establishing a network of partner companies to create an ecosystem, developing in-house services as components of the ecosystem, and constructing a marketplace.

1.4.2 Overview of DBE landscape in Russia

Sberbank, Russia's largest bank, has been actively diversifying its business and building an ecosystem since 2017. The bank aims to satisfy a wide range of customer needs across various sectors, including food, health, retail, entertainment, transportation, real estate, education, finance,

technology, media, and business services. To expand its ecosystem, Sberbank has acquired or partnered with numerous companies in these sectors.

The development of digital ecosystems has transformed Sberbank from a traditional bank into a technology company offering multiple services. The bank's CEO, Herman Gref, envisions Sberbank as an ecosystem where customers have access to a variety of essential services. The process of creating Sberbank's ecosystem involves strategic acquisitions, partnerships, and the development of new services from scratch.

VK Group, formerly known as Mail.ru Group, has transformed from an email service provider into a diverse and robust digital ecosystem. The company has strategically expanded into various sectors to enhance its offerings. It has a strong focus on communication services, particularly with the acquisition of VKontakte, a popular social networking site. VK Group has also made significant investments in education, cybersports, fintech, and other areas such as information services, food, mobility, search, classifieds, e-commerce, music, and games. Through acquisitions, internal development, and partnerships, VK Group has created an interconnected ecosystem that provides users with a wide range of options and experiences. The company continues to evolve and innovate to deliver exceptional digital experiences within its thriving ecosystem.

MTS, also known as "Mobilnye TeleSystemy," is a key player in creating digital ecosystems in Russia. While it primarily focuses on telecommunications, MTS has expanded into other sectors to develop its ecosystem. This includes MTS Bank, which offers financial products and services. In 2014, MTS partially acquired OZON, integrating its telecommunications services with OZON's marketplace to provide customers with a seamless experience. Additionally, MTS has launched internal products such as cable TV services to engage customers and offer entertainment options. MTS continues to strengthen its ecosystem through a combination of acquisitions and internal developments.

Tinkoff Bank, one of the most well-known banks in Russia, is also actively building its ecosystem. Tinkoff differentiates itself by prioritizing its digital platform and offering convenient banking services through its "superapps" concept.

In addition to its wide range of financial products, Tinkoff has expanded into various lifestyle services and a marketplace. These lifestyle services include travel, entertainment, sports, and other related product streams, enabling customers to access a comprehensive range of services within the Tinkoff ecosystem.

Similar to MTS, Tinkoff focuses on internal product development alongside M&A activities to strengthen its ecosystem. The bank has launched various services and features within its digital platform to provide a seamless and comprehensive user experience for its customers.

Yandex, a prominent Russian company, has steadily expanded its business and developed a comprehensive ecosystem offering diverse services. The ecosystem comprises social networks, search and media services, individual user services like taxi and delivery, advertising solutions, and financial services. By integrating these services, Yandex aims to cater to users' diverse needs and enhance their digital experience.

Yandex's ecosystem has evolved through various stages of development. In 1997, the company launched its first search engine, "Yandex-Web." In 2001. it introduced "Yandex.Direct," Russia's first contextual advertising system. In 2005, the Yandex Advertising Network (RSYA) allowed simultaneous ad placement on sites displaying Yandex.Direct ads. The company continued to innovate with services like "Navigator" (2012), providing up-to-date maps and routing, and "Yandex.Parking" and "Yandex.Radio" (2015), offering parking and music services.

In subsequent years, Yandex expanded its services further. It launched "Yandex.Health" (2016), enabling users to schedule appointments with doctors. It developed a voice assistant named "Alice" (2017), capable of assisting users with various tasks. Yandex ventured into self-driving cars and introduced "Yandex.Auto" (2017) as a unifying platform for driver services. In 2018, the company released its first self-developed device, "Yandex.Station," an intelligent speaker with Alice. It also launched services like "Yandex.Drive" (short-term car rental) and "Yandex.Eats" (food delivery).

Yandex's ecosystem encompasses e-commerce services as well. In collaboration with Sberbank, it established a joint venture based on "Yandex.Market" (2018), leading to the launch of the "Beru" marketplace. The company introduced "Lavka" (2019) for express grocery and home goods delivery. Yandex also developed smart home solutions controlled by Alice, including its own smart devices.

During the COVID-19 pandemic, Yandex responded swiftly by launching a real-time service to monitor adherence to self-isolation measures. It also expanded its delivery services, introducing "Click and Collect" on Yandex.Market, small package delivery through Yandex.Taxi, and utilizing the Yandex.Rover robot-courier for food delivery.

Yandex's leadership is evident in segments like Yandex.Taxi, the Russian taxi market leader. The company's financial services have also seen notable growth, with the launch of Yandex Pay in 2021 and the acquisition of Acropolis Bank, now operating as Yandex Bank. The company aims to offer a range of banking products and has partnered with Tinkoff Bank to provide credit options for "Market" customers.

As Yandex continues to evolve, it has experienced a shift in revenue sources. In 2021. revenues from ecosystem services surpassed those from its core technology (monetized through

advertising). This demonstrates the company's focus on expanding its ecosystem and diversifying its revenue streams.

Overall, Yandex's comprehensive ecosystem and continual innovation have positioned it as a leader in various segments, contributing to the advancement of the digital landscape in Russia.

1.4.3 DBE tools enhancing synergy

Cross-service subscription

One of the main goals of ecosystems is to achieve synergy and provide as many ecosystem services as possible to existing and new customers, thereby increasing penetration into the customer base. To achieve this, the ecosystem needs to be equipped with tools that not only exchange customer data between services but also ensure the adaptation of customers to new services.

Akhmayeva (2022) argues that in order for ecosystems to compete successfully and gain significant market share, the implementation of multiservice subscriptions followed by a focus on improving synergies between subscriptions is crucial. The researcher also highlights the success of subscriptions like Walmart+ and Amazon Prime. The adoption of cross-service subscriptions increases the popularity of the ecosystem and hypothetically enhances the perceived value of the ecosystem in the eyes of the customer.

As an example of this approach, we can consider the multi-service subscription of the Yandex ecosystem. The Yandex Plus subscription includes access to various Yandex services such as Yandex Music, Kinopoisk, Yandex Afisha, as well as the production center Yandex Studio.

The number of Yandex Plus subscribers reached 19.3 million by the end of the fourth quarter of 2022, representing a 66% increase compared to the same period in 2021 (Yandex press release, February 15, 2023).

By subscribing to multiple services, users can enjoy various features and benefits, including ad-free music streaming, cloud storage, and discounted rides. The level of multi-service subscription behavior can be influenced by factors such as perceived value, convenience, and trust in the Yandex brand.

Furthermore, the services within the ecosystem offer more tangible benefits to users compared to purchasing similar goods and services from companies and services outside the unified ecosystem. Based on this, we propose the following hypothesis:

H7: *Multi-service subscription moderates the effect of consumption value on the intention to use new ecosystem services.*

Loyalty incentives

Many e-services implement loyalty programs and incentives to retain customers, but there is limited empirical research on the impact of these programs on behavioral intention. Some preliminary studies have not found a significant effect of incentives on loyalty. However, it is argued in the literature that well-executed programs create both psychological and economic reluctance for customers to switch to competitors. This is supported by agency theory, which suggests that incentive benefits align consumer behavior with the firm's goals, and cognitive-learning theory, which suggests that benefits representing value to the customer can encourage loyalty (Naidoo, 2007).

One form of loyalty incentives is the trend of organizing cashback and bonus programs. Many ecosystems use this strategy to increase loyalty and enhance the value of their offerings. For example, Sberbank uses "Spasibo" points, which can be obtained as cashback for using Sberbank's services or its partners' services with a Sberbank card. Yandex employs a similar strategy with "Yandex Plus" subscription, where points can be earned through various activities, from payments to playing games in the Yandex Plus mobile app.

Since loyalty incentives in the form of cashback are recognized as an effective method to increase customer loyalty and additionally serve to integrate users into a wide range of offerings, products, and services within ecosystems, we intend to evaluate the contribution of this tool to the intention of using ecosystem services. Therefore, this paper supports the idea that loyalty incentives can significantly influence the perceived value of a digital business ecosystem. Consequently, the hypothesis is proposed:

H8: *Loyalty incentives moderate the effect of consumption value on the intention to use new ecosystem services.*

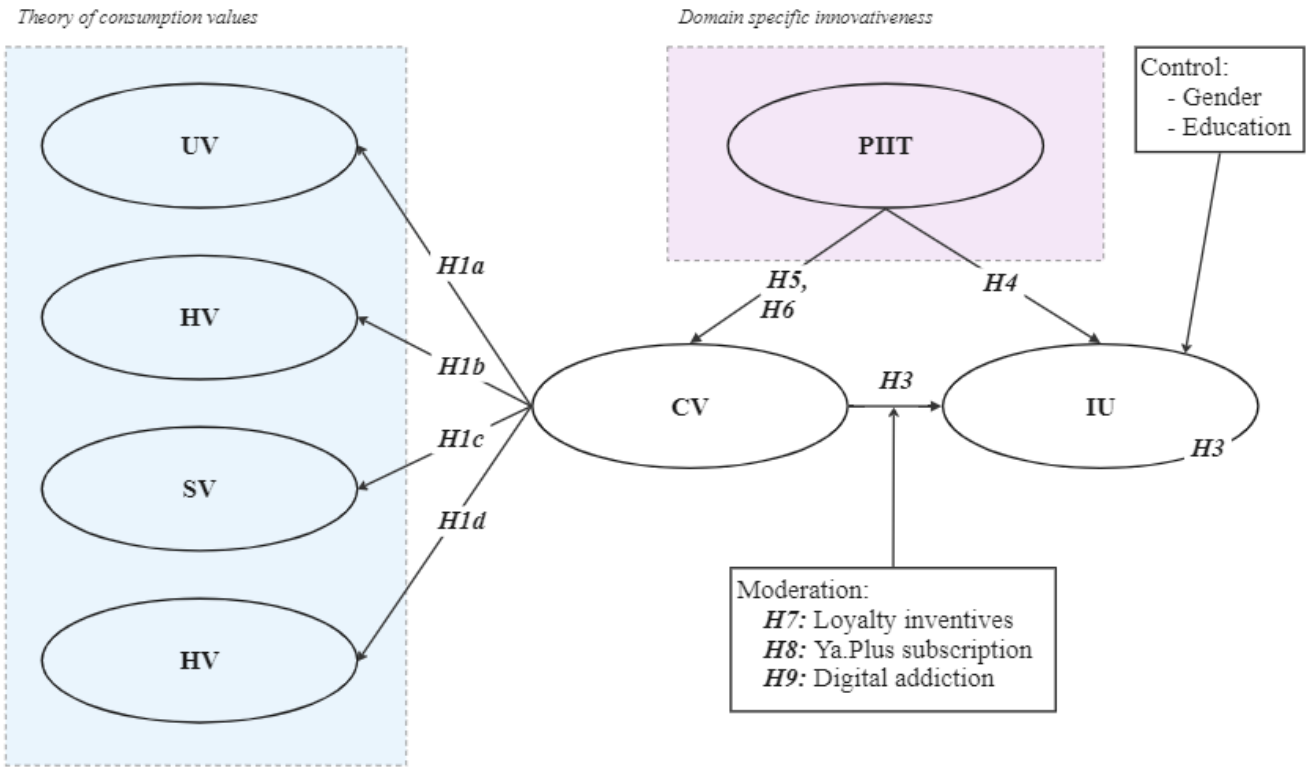
1.5 Final research model

Coming up with all the constructs, the model helps to conclude about quantitative relationship and degree of effect of some dimensions of value or loyalty incentives on overall perception of ecosystem value and intention to use its services. Thus, the consumption value here is composed from 4 facets (namely, SV, HV, NV, UV) and personal innovativeness in IT domain is included in order to measure the mediating effect.

Based on proposed methodology, theoretical foundations and constructs description, proposed conceptual research paper look as presented in figure 1.2.

Figure 1.2.

Final research model with hypothesis



All these examinations will be conducted in the context of Russian users of Yandex ecosystem services. Knowing beforehand about the possible elements and characteristics of business ecosystem, the model can be adjusted in order to address and reflect the specifics value perception that will depend on multiple aspects.

For example. Not all business ecosystems employ subscription in order to increase customer loyalty and intention to use and adapt new services of ecosystem. By including specific variables in the proposed model, it is possible to capture unique relationship and traits that will contribute or relate to Consumption Value of particular ecosystem.

For the convenience of the reader, hypothesis list is presented in Appendix A.

1.6 Summary of Literature review

The presented literature review explores the history and development of the concept of ecosystems and provides a comprehensive definition of a business ecosystem. It also discusses the different types of ecosystems, comparing and differentiating innovation, entrepreneurial, business, and knowledge ecosystems. All four types of ecosystems involve networks of interdependent participants who collaborate to create something new. In the knowledge ecosystem, the focus is on the production of new knowledge, with interactions primarily occurring between businesses, universities, and institutes. In contrast, an innovation ecosystem involves cooperative arrangements to combine the production and research capabilities of different companies to foster innovation. The entrepreneurial ecosystem encompasses a wide range of stakeholders involved in entrepreneurial activities and provides insights into social trends, regulatory constraints, and opportunities. The business ecosystem, on the other hand, primarily focuses on profit extraction and examines the micro-level interactions between focal actors and complements. It incorporates many characteristics of the other three types of ecosystems: knowledge exchange among participants is also a characteristic of ecosystems, with digital business ecosystems often involving data exchange. Many ecosystems strive to create an environment conducive to entrepreneurial activities and encourage employees to develop innovative solutions, which is particularly evident in innovation ecosystems.

Each type of ecosystem possesses unique characteristics that define its setting and focus. For example, the presence of an orchestrator, such as a central company or stakeholder, regulates the degree of alignment and cooperation among participants. Similarly, value creation and value capture have different implications in different types of ecosystems. Furthermore, the roles of actors within ecosystems play a crucial role, and the modularity of participants is a unique characteristic of business ecosystems, allowing for a balance between independence and interdependence.

To provide an inductive view of ecosystem types, the review also examines two popular types: product-based ecosystems and platform-based ecosystems. Platform-based ecosystems focus on transactional relationships, where the platform serves as a common ground connecting a double-sided market of customers and suppliers. Orchestrators play a significant role in ensuring value creation and capture processes for all participants by providing rules, regulations, and incentives. On the other hand, product-based ecosystems concentrate on a one-sided market where the ecosystem itself serves as the supplier, offering a focal actor's product along with multiple complementing offers. Digital business ecosystems, such as those of Amazon, Google, Microsoft, Adobe, Yandex, Tinkoff, Sber, and VK Group, often exhibit this type of ecosystem. However, some systems can combine both approaches, with platform-based ecosystems nested within product-based ecosystems, as seen in the case of Amazon Marketplace and Yandex. Market.

Focusing on product-based ecosystems, the complementarity of actors in creating a unified value proposition is crucial. The combination of unique value propositions from all participants, along with the focal actor and complements, enhances the competitive offering and its attractiveness to customers. At the same time, customers have their own ecosystem of needs. A customer-centered ecosystem arises when the business ecosystem's offering aligns with the array of customer needs. For example, Yandex Go aims to fulfill all transportation and navigation-related needs.

In this section, we describe what we believe needs to be explored from a consumer perception perspective. Since current research assumes that business ecosystems provide an integrated value proposition, we emphasize the importance of empirical research from the customers' viewpoint. We then delve into the development of the theory of perceived customer value, evaluating its application to intention to use in various contexts. By comparing it with other value approaches and considering the theories commonly used to measure intention to act, we identify and justify the use of the Theory of Consumption Values in the context of digital business ecosystems. We also assess and examine different contexts to which ecosystems have been applied and identify that ecosystems have never been applied in some contexts. Furthermore, we discuss literature where value is defined as a unidimensional construct and a multidimensional construct. This led to the assessment of different approaches to value, and we propose hypotheses regarding usefulness value, social value, hedonic value, and novelty value in relation to ecosystems.

We have also raised the question of innovation, particularly in the context of Generation Z, which will soon become the dominant consumer generation whose consumption patterns will shape services and businesses. Based on current trends of digital dependency among Generation Z, we have proposed hypotheses aimed at determining whether Generation Z perceives internet services in the same way as other generations and how this perception influences their perceived value, which ultimately affects their intention to use e-services.

Furthermore, we have examined ways to motivate customers to remain within the ecosystem, use a greater number of ecosystem products, and cultivate loyalty among the target user group. Among these tools, loyalty incentives in the form of cashback have been highlighted, which unify a common currency among ecosystem services. It is hypothesized that this should influence the relationship between value and intention. The second form of instrument considered is multi-service subscription, implemented by companies like Amazon, Walmart, and Yandex. The hypothesized influence of such a subscription on the value of ecosystems has been suggested to be significant and therefore requires empirical validation.

Throughout the literature review, we have provided a comprehensive overview of current theories in business ecosystems, research on value and innovation, and methods for enhancing

customer interaction with ecosystem products and services. We have emphasized the necessity of empirical validation of tools as well as the application of innovation and perceived value theories to the context of ecosystems and the integrated value proposition defined by a set of complements and actors within a digital business ecosystem.

CHAPTER 2. METHODOLOGY

The empirical research methodology of the presented paper is the main topic of this chapter. The topics will also include operationalization, data processing, data collection methods, and concept creation for questionnaires. The majority of the literature on ecosystems now in existence uses qualitative or conceptual research methods; this study instead takes a quantitative approach that includes multivariate analysis and structural modeling. The theory that is being used is the theory of consumption values, which has never been used to explain the integrated value of digital business ecosystems when joined with a variety of complementors.

Classical values like usefulness value, hedonic value, social value, and novelty (epistemic value) value are examples of constructs. These components are used to create questionnaires that will be used to initiate surveys and give an overview of ecosystems. Data processing and analytics technologies will be introduced, as well as the conceptual research model.

The structural equation modeling (SEM) model that will be used in further research. SEM provides a thorough framework for examining intricate interactions between numerous variables (Iacobucci, 2010b). It enables the study of the measurement and structural models simultaneously while evaluating their validity, reliability, and causality (Sundie, 2009).

SEM has the advantage of handling varied interactions, which allows it to provide light on theoretical limits and psychological processes (Aiken & West, 1991; Baron & Kenny, 1986). It is possible to identify moderators that affect the relationship between the perceived value of the business ecosystem and the intention to use new e-services by examining interaction effects (Fabrigar, 2010).

Additionally, SEM enables the investigation of mediating mechanisms, shedding light on the ways in which intervening variables affect how perceived business ecosystem value affects intention to utilize new e-services (Baron & Kenny, 1986). The psychological mechanisms behind consumer behavior are better understood when these processes are understood (Barone & Roy, 2010).

The research model's portrayal of correlations between perceived business ecosystem value and intention to adopt new e-services is also validated by SEM's ability to assess overall model fit and goodness-of-fit indices (Bagozzi & Yi, 1988).

The current study makes use of SEM in order to fully investigate the measurement model, evaluate validity and reliability, look at interaction effects and mediation processes, and evaluate overall fit. It also tries to capture the complexity of relationships. With the help of this method, academia and business will gain a thorough grasp of the psychological mechanisms influencing customer behavior.

2.1 Case of Yandex

Current study will assess the case of Yandex digital business ecosystems as this player can be seen as an example for digital business ecosystems from the criteria of ecosystems: it is a network of complementary services with main point of entry as Yandex.Go or Yandex search. Company fosters innovation within itself and constantly launches new services and acquire new companies that serve as a complements. Additionally, Yandex has both cross-service subscription that called Yandex.Plus and loyalty incentives that awards the clients for using services of ecosystem. The penetration of Yandex services within Gen Z will be assessed further, however the popularity is clear with over a 40 millions of Go users and 20 millions of Yandex.Plus subscription. (Yandex press-release, 2023)

In order to provide the context behind Yandex, we will provide a description of its history and services that are included within this DBE.

Yandex, a prominent Russian company known for its search engine services, has been steadily expanding its business and offering a diverse range of services within its ecosystem. Unlike Sberbank, Yandex has taken a longer-term approach to diversifying its offerings. While Yandex and Sberbank had previously collaborated on joint projects, Sberbank eventually decided to develop its own ecosystem, leading to a competition between the two companies (Balashova & Parfenteva, 2020).

Yandex's ecosystem comprises various groups of services that add value and capabilities to the overall digital landscape. These include social networks, search and media services, individual user services (such as taxi services), advertising services, and financial services. By integrating these services, Yandex aims to create a comprehensive ecosystem that caters to the diverse needs of its users.

The company's information services, which are tightly linked to its search engine, form a significant part of the ecosystem. These services provide users with access to a vast amount of information and knowledge, allowing them to find answers, explore topics of interest, and stay informed. This empowers users to make informed decisions and enhances their overall digital experience.

Yandex's social networks, search, and media services offer platforms for users to connect, engage, and share content. These services facilitate communication, collaboration, and the exchange of ideas, fostering a vibrant online community within the ecosystem. Users can discover and consume a wide range of media content, including news, articles, videos, and more, enriching their digital lives.

The inclusion of individual user services, such as taxi services, brings convenience and accessibility to users. Yandex's taxi service, for instance, provides a seamless and efficient way for users to book and enjoy rides. By leveraging technology and data, Yandex enhances transportation experiences and contributes to the advancement of the sharing economy.

Advertising services within the Yandex ecosystem enable businesses to reach their target audiences effectively. Yandex offers various advertising solutions, including search advertising, display advertising, and contextual advertising. These services help businesses promote their products or services, drive customer engagement, and generate valuable leads, contributing to the growth of the digital advertising industry.

Financial services are another essential component of the Yandex ecosystem. Yandex provides users with access to convenient and secure online payment solutions, enabling seamless transactions and enhancing the overall user experience. These financial services play a vital role in facilitating e-commerce activities within the ecosystem and contributing to the growth of the digital economy.

Overall, Yandex's ecosystem brings value and capabilities to users by offering a wide range of services that cater to their information needs, social interactions, transportation requirements, advertising goals, and financial transactions. By integrating these services and continually innovating, Yandex enhances the digital experience of its users and contributes to the development of the broader digital ecosystem.

Yandex is an undisputed leader in several segments. The most notable one is Yandex.Taxi (joint venture between Yandex and Uber), which is the absolute leader in the Russian taxi market. According to the Moscow Department of Transportation data from April 202. Yandex.Taxi accounted for 63.1% of total ride orders, and its revenue in the second quarter of 2021 reached 28.1 billion rubles (approximately 30% of the company's total revenue). This business brought Yandex more than 1 billion rubles in profit.

Yandex is actively working on the development of its financial service. In March 2021. Yandex Pay, a payment service, was launched. It allows users to make online purchases with their bank cards without entering card details every time. Yandex Pay simplifies card payments within Russia: users only need to link their bank card to their Yandex account once and can then make payments for goods and services with just one click.

The emergence of the coronavirus and the subsequent pandemic significantly increased the demand for contactless (digital) services, as well as online shopping and delivery services.

In the summer of 2021. Yandex acquired Acropolis Bank, which now operates under the new name "Yandex Bank." The bank's first announced product was a loan program for drivers and

couriers. In the future, Yandex plans to offer other banking products for different categories of individuals. Additionally, Yandex launched its own installment service called "Split" and partnered with Tinkoff Bank to provide credit options for "Market" customers.

As for the company itself, 2021 was a turning point for Yandex, as for the first time, revenues from its core technology, which is monetized through an advertising model, accounted for less than half of its total revenues. Overall, the share of revenues from ecosystem services is higher for Yandex and other large technology companies compared to fintech and telecom companies, even though there is a growth in the share of revenue from the ecosystem while the main business revenue decreases.

2.2 Research model constructs

2.2.1 Consumption value as multifaceted construct

Consumption value is a multifaceted construct composed of usefulness value, hedonic value, novelty value and social value. Several studies have discussed the influence of the value dimensions on the adoption of new products (Hur, 2012; Wu & Chang, 2016). Lin (2005) emphasized that the definition of consumption value is an overall assessment, and it is viewed as a multi-dimensional construct and it is an aggregation of perceptions of various consumption values. Each component value is expected to contribute different degrees toward consumers' total value assessment.

The adoption of a multifaceted construct seems to occur when the construct, serves as a convenient summary for several subsidiary tendencies that contribute to it. It is Adapted when the whole seems more meaningful than any specific part and perhaps even more than the sum of the parts (Carver, 1989). Appealing to any one component of such a construct fails to capture something of its overall essence (Vij & Walker, 2016). Thus, this synergetic approach assumes that the whole is greater than or different from the sum of its parts (Carver, 1989). Following this approach, we assume that the CV, as a multidimensional construct, will better explain intention to use business ecosystem services than all the separate values taken together.

In digital business ecosystems, consumption value (CV) is influenced by the interplay of value dimensions of complements, and the focal actor's value proposition. CV goes beyond individual components, as synergies among them enhance the overall experience. Diverse complements add functionality and convenience, while the focal actor's value proposition attracts consumer engagement. Considering these factors is crucial when examining CV's influence on intention to use business ecosystem services.

Usefulness value

In the context of digital business ecosystems like Yandex, customers assess the relevance and desirability of products based on how their features align with individual consequences of product use. The usefulness value of products refers to the perceived utility derived from their functional, utilitarian, or physical performance. Functional value is measured based on the possession of salient attributes that meet customers' needs (Sheth, 1991). Models such as the Technology Acceptance Model (TAM) have examined constructs like perceived usefulness and perceived capability, which significantly influence customers' willingness to purchase or intention to use products (Davis, 1989).

Multiple studies employed this factor in testing for effect of usefulness value on intentions and willingness, for example, Omigie (2017) applied it to study adoption of mobile financial services, therefore the scale was adapted:

Table 2.1.

Adapted items for Usefulness Value

Variable	Items	Adapted from	Measurement
UV1	Using Yandex ecosystem services helps me save time and effort	Omigie, 2017	Likert 5-point scale
UV2	Yandex ecosystem services meet my needs		
UV3	Yandex ecosystem services simplify my daily tasks and routines		
UV4	I believe that Yandex ecosystem services are practical and functional		

Note. UV – Usefulness Value of Yandex ecosystem

Hedonic value

Consumers' evaluations of hedonic and utilitarian attributes have been extensively studied in relation to their influence on consumer attitudes and behavior (Alba & Williams, 2013). Hedonic value, characterized by feelings of pleasure, comfort, safety, and relaxation, plays a significant role in consumer perception and expectations of products or services. The inherent hedonic value of a brand can create product personality attraction and positively impact consumers' behavioral intentions (Ekawati, 2021). Additionally, hedonic value contributes to the overall consumption value of a product or service.

In the context of digital business ecosystems, such as Yandex, the notion of hedonic value becomes crucial. These ecosystems offer a wide range of products, services, and platforms that cater to consumers' hedonic experiences and emotional satisfaction. The seamless integration of services,

personalized recommendations, and superior user experiences provided by digital business ecosystems like Yandex contribute to the hedonic value perceived by consumers. The pleasure, comfort, and relaxation derived from engaging with the ecosystem's offerings enhance consumers' overall satisfaction and positively influence their behavioral intentions, such as continued usage and loyalty (Ekawati, 2021). Recognizing the significance of hedonic value within digital business ecosystems is essential for understanding and leveraging consumers' emotional responses and engagement with the ecosystem's offerings, thus fostering long-term relationships with consumers.

Ekawati (2021) explored the effect of hedonic value of e-services on behavioral intention and further we adopt validated items for use in DBE context:

Table 2.2.

Adapted items for Hedonic Value

Variable	Items	Adapted from	Measurement
HV1	Yandex ecosystem services provide me with a pleasant experience	Ekawati, 2021	Likert 5-point scale
HV2	I like the interface and design of Yandex ecosystem services		
HV3	Using Yandex ecosystem services gives me a sense of satisfaction		
HV4	In general, using Yandex ecosystem services brings me joy		

Note. HV – Hedonic Value of Yandex ecosystem

Social value

Perceived social value plays a crucial role in influencing consumer behavior and satisfaction (Keshavarz, 2018). Research has shown that the perception of social value has a positive impact on consumer action intentions (Kervenoael, 2020). For instance, Chen and Zhang (2021) found that social value directly influences consumers' purchase intentions for green products. Additionally, Jaleel (2021) examined the relationship between consumers' perceived value and behavioral intention in the context of medical tourism services and identified that perceived social influence and social value significantly influence usage intention.

Considering digital business ecosystems such, the concept of social value becomes particularly relevant. DBE can leverage the importance of social value by highlighting the societal recognition. By effectively capturing and promoting social value, companies can enhance consumers' perception of the ecosystem's desirability and stimulate increased engagement and loyalty among its user base.

Venkatesh (2012) applied a scale in order to assess the effect of social value on acceptance of information technology and concluded that social value positively and significantly affect the acceptance. Further we adopt the scale that he used in this study:

Table 2.3.

Adapted items for Social Value

Variable	Items	Adapted from	Measurement
SV1	I think others most likely expect me to use Yandex ecosystem services	Venkatesh, 2012	Likert 5-point scale
SV2	I think that my friends rather approve of my use of Yandex ecosystem services		
SV3	I think that people whose opinion is important to me use Yandex ecosystem services		
SV4	I think Yandex ecosystem services are popular among my peers		

Note. SV – Social Value of Yandex ecosystem

Novelty value

Novelty value, also known as epistemic value, is an important aspect of consumer behavior that relates to the extent to which a product or service provides unique and new opportunities, satisfying consumers' curiosity (Fazal-e-Hasan, 2021). Previous research has shown that novelty value significantly influences consumers' intention to use innovative technologies and services (Fazal-e-Hasan, 2021; Truong, 2020; Adapa, 2020). For instance, Fazal-e-Hasan (2021) found that novelty value positively affects consumers' intention to use intelligent retail technology. Similarly, Truong (2020) emphasized that meeting customers' expectations of exploration and learning through differentiated functions in new services leads to increased usage intentions. Furthermore, Adapa (2020) established a positive relationship between perceived novelty and usage intent. Building on these findings, this study aims to examine whether novelty value serves as a distinctive measure of consumption value.

In the context of digital business ecosystems like Yandex, the concept of novelty value holds significance. As users engage with Yandex's ecosystem, the presence of novel and unique opportunities can enhance their perception of value. By providing innovative features, services, and experiences that differentiate it from competitors, company can appeal to individuals seeking new and exciting possibilities. By focusing on the sense of discovery and exploration within its ecosystem, ecosystem can attract users who value novelty. Understanding the role of novelty value

in shaping consumers' intentions to utilize Yandex's ecosystem services contributes to a deeper understanding of consumer behavior within digital business ecosystems.

Truong (2013) explores the value and consumer innovativeness in his study towards IT service adoption. Based on his findings Adapted items are suggested:

Table 2.4.

Adapted items for Novelty Value

Variable	Items	Adapted from	Measurement
NV1	It seems to me that Yandex ecosystem services offer innovative and unique opportunities	Truong, 2013	Likert 5-point scale
NV2	I believe that Yandex ecosystem services are more advanced than their competitors		
NV3	I believe that Yandex ecosystem services stand out from other similar services		
NV4	I believe that the Yandex ecosystem is constantly introducing new and revolutionary services		
NV5	I think that Yandex ecosystem services are ahead of the innovation trends in the industry		

Note. NV – Novelty Value of Yandex ecosystem

2.2.2 Intention to use

Intention to use is a fundamental construct that plays a crucial role in understanding consumer behavior within digital business ecosystems like Yandex. The intention to use a particular ecosystem is an important measure of consumers' future usage plans and their willingness to engage with the ecosystem's various services (Ajzen & Fishbein, 1980).

Theories such as the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) and the Technology Acceptance Model (TAM) (Davis, 1989) have been developed to explain the factors influencing intention to use. These models highlight the significance of factors such as perceived usefulness, perceived ease of use, attitude, subjective norm, and behavioral control in shaping consumers' intention to use a product or service.

Research has consistently demonstrated that intention to use is a strong predictor of actual usage behavior across various contexts, including e-commerce, mobile banking, and social networking sites (Agarwal & Karahanna, 2000; Lin, 2011). For instance, Agarwal and Karahanna (2000) found that intention to use significantly predicts online shopping behavior, with a stronger impact than perceived usefulness alone.

Considering the importance of intention to use in digital business ecosystems, it becomes crucial for ecosystem providers like Yandex to encourage users to utilize multiple services within the ecosystem. By getting people to use more services and facilitating seamless integration among them, ecosystem providers can increase user engagement, satisfaction, and loyalty as well as profit. Understanding the underlying factors that influence intention to use within digital business ecosystems is vital for ecosystem providers like Yandex to design effective strategies and optimize the user experience.

Hanafizadeh (2012) uses 4-item scale in order to capture intention to use in context opf mobile banking adoption. Similarly, Goh (2014) used the same scale for the same study for another geographical region. Adapted items are presented below.

Additionally, in order to capture intention towards various ecosystems of customer's needs, we suggest items for each category of need that Yandex covers.

Table 2.5.

Adapted items for Intention to use

Variable	Items	Adapted from	Measurement
IU1	I will try to use new Yandex services as they are released	Hanafizadeh, 2012; Goh, 2014	Likert 5-point scale
IU2	In the next 3 months, I will most likely try a new Yandex ecosystem service for me		
IU3	I plan to continue using Yandex ecosystem services in the future		
IU4	I will actively explore new features and services introduced by the Yandex ecosystem		
IU5	I intend to use the new financial services of the Yandex ecosystem	Authors suggestion	Likert 5-point scale
IU6	I intend to use the new Yandex ecosystem delivery services		
IU7	I intend to use the new educational services of the Yandex ecosystem		
IU8	I intend to use the new Yandex ecosystem travel services		
IU9	I intend to use the new social services of the Yandex ecosystem		
IU10	I intend to use the new business services of the Yandex ecosystem		
IU11	I intend to use the new Yandex ecosystem search services		
IU12	I intend to use the new personal organization services of the Yandex ecosystem		

Note. IU – Intention to use new services within Yandex ecosystem

2.2.3 Product innovativeness in IT domain

Product innovativeness is a variable that measures individual trait as an attitude towards new IT products and services. It has been recognized as a key driver of adoption and usage behavior in the IT domain (Moon & Kim, 2001; Lee & Park, 2008).

Research has shown that product innovativeness has a positive influence on intention to use in various IT contexts, such as mobile apps (Chen, 2014), social media (Lee & Park, 2008), and e-commerce (Moon & Kim, 2001). For instance, Chen (2014) found that product innovativeness significantly predicts mobile app adoption intention, and that the effect of product innovativeness on adoption intention is stronger than the effect of perceived usefulness.

Moreover, research has also suggested that consumption value (i.e., utility, hedonic, and social value) plays a mediating role in the relationship between innovativeness and intention to use. For example, Park (2007) found that hedonic value mediates the effect of perceived innovativeness on online game adoption intention. Similarly, Lee and Park (2008) found that social value mediates the effect of perceived innovativeness on social media adoption intention.

We adapt the scales from Hartman (2004) that was considering both Product and Information innovativeness and aggregate it in same construct.

Table 2.6.

Adapted items for product innovativeness in IT

Variable	Items	Source	Measurement
PIIT1	I often start discussions about using new IT products or services with other people.	Hartman, 2004	Likert 5-point scale
PIIT2	I am interested in exploring the possibilities of new IT products and services		
PIIT3	I am actively looking for information about new IT products and services		
PIIT4	I am more interested in new IT products and services than my friends		
PIIT5	I keep myself up to date with the latest trends in technology and services		
PIIT6	I am always eager to try new IT products and services		

Note. PIIT – Product innovativeness in IT domain

2.2.4 Loyalty incentives

Loyalty incentives, such as cashback programs, play a significant role in the context of digital business ecosystems like Yandex by encouraging users to engage with and utilize more services within the ecosystem. While empirical research on the impact of loyalty programs on behavioral intention is limited, the existing literature suggests that a well-executed program can create both psychological and economic barriers for customers to switch to competitors (Bhattacherjee, 2001).

The influence of loyalty incentives on behavioral intention can be explained through two theoretical perspectives. Firstly, agency theory suggests that incentives align the consumer's behavior with the goals of the ecosystem provider, promoting continued usage of their e-services (Bhattacherjee, 2001). By offering incentives such as cashback, the ecosystem provider creates a sense of mutual benefit, incentivizing customers to remain loyal and engaged.

Secondly, cognitive-learning theory posits that benefits associated with loyalty incentives can foster positive attitudes and behaviors among customers (O'Brian & Jones, 1995). In the case of cashback programs, the economic value and perceived benefit received from earning cashback can enhance the perceived value of ecosystem services. This, in turn, can strengthen customers' loyalty and their intention to continue using the ecosystem's services.

By implementing loyalty incentives like cashback, digital business ecosystems like Yandex aim to enhance the perceived value of their services and foster customer loyalty. Through aligning consumer behavior with the ecosystem's goals and providing tangible benefits, loyalty incentives contribute to creating a positive user experience, driving increased usage, and strengthening customer engagement within the ecosystem.

Naidoo (2007) explored the influence of loyalty incentives on continuance intention of e-services continuance. He did not find significant relationship between IV and DV, however his scale it very close to our needs and we intend to apply this to modern context:

Table 2.7.

Adapted items for Loyalty incentives

Variable	Items	Source	Measurement
LI1	The Yandex ecosystem offers many incentives to use its services	Naidoo, 2007	Likert 5-point scale
LI2	I like to take advantage of the I+ cashback program.		
LI3	I receive appropriate reward for using Yandex services		
LI4	I would be disappointed if I could no longer use the I+ cashback program		

Note. LI – Perception of Loyalty Incentives within Yandex ecosystem

Loyalty incentives (LI) were assessed using a scale adapted from Naidoo (2007), consisting of four items. A factor analysis was conducted on the scale revealing its unidimensionality. Next, in order to create groups for moderation testing, the sample data was split into two groups based on a median split of the composite score of the LI scale. This split resulted in a high LI group and a low LI group, which were then used to explore the moderating role of LI (Chong, 2002).

The reliability of the composite measure was deemed acceptable, as indicated by a Cronbach's alpha coefficient of $\alpha = 0.64$. ANOVA tests conducted between the two LI groups showed significant differences, with the least F statistic value being 110.583 and all p-values being less than .001. The means of the two groups exhibited substantial differences. For instance, for LI1. the mean of the first group was 2.179, while the mean of the second group was 4.04. The standard error for both groups was at the .09 level. These findings suggest that there are significant disparities between the groups in terms of their perception and appreciation of loyalty incentives provided by Yandex. Specifically, the first group comprises individuals who do not greatly value the loyalty incentives offered by Yandex.

In summary, the analysis of the LI scale items revealed two meaningful factors related to task uncertainty. The subsequent grouping of the sample data based on LI scores allowed for further examination of the moderating role of LI. The ANOVA results demonstrated significant differences between the high and low LI groups, indicating contrasting perceptions and appreciation of the loyalty incentives provided by Yandex.

2.2.5 Digital addiction

The concept of Digital Addiction (DA) is highly relevant from the perspective of customers' perception of value and intention to use new services within the Yandex ecosystem. As Generation Z, who are considered major consumers of digital devices and services, exhibit a strong affinity for technology and multitasking (Adıguzel, Batur & Eksili, 2014), it becomes crucial to understand their addiction tendencies and behavioral patterns. DA is characterized by a strong liking and dependence on digital devices, leading to compulsive and recurring behaviors that may negatively impact various aspects of life (Angres & Angres, 2008).

Within the Yandex ecosystem, where numerous features and services are offered, understanding the impact of DA becomes even more significant. The widespread use of digital devices among Generation Z for communication, social media interactions, entertainment, and more (Leena, Tomi & Arja, 2005) highlights the potential for addictive behaviors to arise. Although DA may not be classified as a severe pathological disorder (Ozkan & Solmaz, 2015), it is essential to

consider the influences of impulsivity and materialism, which can lead to social detachment from the broader society (Jones, 2014).

By addressing DA within the context of the Yandex ecosystem, a more holistic approach can be taken towards enhancing customers' perception of value and fostering positive intentions to use new services while also promoting digital well-being. We therefore aim to assess does the addiction influence intention to use new services of Yandex ecosystem.

Young, (1998) introduced a 16 item scale for measuring the digital addiction and then multiple studies intended to make this questionairt shorter. We will employ short version of the scale Adapted from Pawlikowski (2013).

Table 2.8.

Adapted items for Digital Addiction

Variable	Items	Source	Measurement
DA1	I often feel depressed, pessimistic, and angry when cannot use IT services	Pawlikowski, 2013	Likert 5-point scale
DA2	I am highly dependent on the use of IT products and services		
DA3	I can't imagine being without IT products and services in my daily life		
DA4	The option to live without IT services and products makes me nervous		

Note. DA – Digital addiction to IT services and products

Digital Addiction (DA) was assessed using a scale adapted from Pawlikowski (2013), consisting of multiple items. A factor analysis was conducted on the scale, revealing the underlying dimensions of DA. To create groups for multigroup analyses, the sample data was divided into two groups based on a median split of the composite scores of the DA scale. This resulted in a high DA group and a low DA group, which were then utilized to explore the potential moderating role of DA.

The reliability of the composite measure was assessed using Cronbach's alpha coefficient, which yielded an acceptable value of $\alpha = 0.69$. An analysis of variance (ANOVA) was conducted to compare the mean scores between the high and low DA groups. The F statistic obtained from the ANOVA was 202.708, and all associated p-values were found to be significant. These results indicate that there are substantial differences between the two groups in terms of their levels of DA.

Specifically, the mean score for the first group in terms of DA was 2.54, with a standard error of 0.107. In contrast, the mean score for the second group was 4.43, with a standard error of 0.05.

These findings suggest that there are significant disparities in the perception and experience of DA between the two groups. The first group represents individuals who exhibit lower levels of DA, while the second group comprises individuals who display higher levels of DA.

To summarize, the analysis of the DA scale items revealed distinct dimensions related to digital addiction. By dividing the sample into high and low DA groups, it was possible to investigate the moderating role of DA. The ANOVA results confirmed significant differences in the mean scores between the two groups, indicating varying degrees of digital addiction.

2.2.6 The control variables

Presented research paper accounts for demographic variables and treat education and gender as control variables. Therefore, these variables are not to be included in the model, but its effect on intention to use and consumption value will be examined and held constant.

2.3 Summary of research constructs

2.3.1 Scales and references

The research employs classical theory of consumption values with addition of Domain Specific Innovativeness theory. All questions were adapted and reformulated in order to be relevant to the new context – IT business ecosystems. Below presented the researches from which the scales were retrieved.

Table 2.9.

List of factors and scales

Variable	Definition	Type	Reference
Product Innovativeness in IT domain	Degree of individual interest in novel IT services and products	Scale	Hartman, 2004
Usefulness value	The level of perceived capability that ecosystem services provide	Scale	Omigie, 2017
Hedonic value	The feelings of pleasure, satisfaction and comfort towards ecosystem services	Scale	Viswanath, 2012
Novelty value	The level of perceived novelty and uniqueness of ecosystem services	Scale	Truong, 2013
Social value	The extent to which usage of ecosystem services differentiates one’s social perception.	Scale	Venkatesh, 2003

Intention to use	The level of intention to use e-services of ecosystem in future	Scale	Hanafizadeh, 2012; Goh, 2014
Loyalty incentives	Customer's beliefs about loyalty incentives	Scale	Naidoo, 2007

2.4. Data gathering

2.4.1. Construct operationalization

The method of data colleting was applied according to the existing studies on consumption values and brand perception, the method included online survey distributed among target audience of generation Z. Online surveys are a common method for hypothesis testing in consumer behavior research, therefore the developed questionnaire was comprised from previous studies and items for it were adapted for application towards ecosystem products perception.

It is important to note that the questions were translated from English to Russian, then adjusted for ecosystem context. The survey screenshots are accessible in Appendix D. The correctness of transition from English to Russian was checked with English native speaker fluent in Russian. The questionnaire was developed by the researchers and proof-read by English and Russian languages native speakers to ensure correct question interpretation.

Part 1 of survey included the welcoming introduction and brief explanation of what business ecosystem is with and some examples (namely Sberbank, Tinkoff, Yandex, VK). The term was described briefly in order to provide a quick understanding of the questions. The survey was focused mainly on IT products and services of Yandex ecosystem, therefore additional descriptions and definitions were provided. Finally, the form included the agreement and a line regarding privacy concerns. The survey did not include any personal data, therefore we did not include a profound consensus for data collection.

Part 2 of survey was focused on usage behavior of Yandex ecosystem products and services. It was suggested to the respondents to rate their usage of each Yandex service from 0 (I don't use it) to 3 (I use it frequently). The list of Yandex services was retrieved from official website on April 2023.

Part 3 of the questionnaire included items measuring personal attributes, namely addiction behavior and innovativeness, questions were formulated without focus on particular ecosystem.

Part 4 was the main part where participants were evaluating their value perception of Yandex ecosystem services as well as intention to use. All questions were employing Likert 5-point scale (Likert, 1932) and the participants rated their agreement with statements from 1 (strongly disagree) to 5 (strongly agree). At the middle of part 3, the attention trap question was added in order to control for non-involved responses: "Please check 'fully disagree' in this question".

Part 5 of the survey was centered on demographic data of the respondents: gender, age, educational degree. The age inquiry also acted as a screening question to filter generation Z respondents from other generations according to the research goal.

Next the pilot study was conducted in order to gather feedback on each question perception according to the BRUSO model (Peterson, (2000). Feedback was then used in order to delete incorrect items or make some of them easier to understand.

As the developed questionnaire was mainly adapted and substantially changed in order to satisfy our research scope and be applicable to the business ecosystem context, it was decided to additionally test the items using talk-aloud exercise with target group close to target population based on convenience sampling technique. All questions were read without substantial difficulties and all questions were specified as straightforward thus indicating absence of double-meaning.

All indicators were reflective and the results of pilot study showed reliable Cronbach Alpha (>.7 level) and consistent factor loadings, therefore is was decided to launch the survey for target audience.

2.4.3. Data collection

As the sampling technique, the non-probability purposive sampling was chosen in order to gain representative amount of observations from Generation Z. To conduct the study about 271 questionnaires were distributed via social media VK and Telegram messenger with direct messages. The target audience of the study composed of people who used the Yandex ecosystem services and this audience should have been from Gen Z. Therefore, Age question as well as usage question were used for filtering purposes. Total of 210 responses on the survey were obtained from target audience.

Initial sample of 210 respondents was inspected for presence of outliers and suspicious answers. The identification was based on following criteria:

1. Attention-trap question “Please check ‘fully disagree’ in this question” was used to identify respondents that were not involved in the process (Liu, 2018). All scores except of 1 were deleted. This approach identified 11 responses and therefore they were deleted from the final data-set.
2. Straight lining (respondents mark all answers with the same score) coupled with ranking by Mahalanobis distance (McLachlan, 1999) that was calculated using SPSS of all replies was considered. Additional 9 responses were deleted based on this criteria.

After the cleaning and analyzing process and omitting irrelevant results, 190 usable responses were left in order to proceed the following research, which amounted all in all to 7.1% response rate. There was no missing data due to each question marked as obligatory.

2.4.4 Descriptive statistics

Final sample consisted of 190 responses. 43 questionnaire items were collected in order to meet criteria for Structural equation modelling for 5 responses per each variable. Age, Gender, Education variables were gathered in order to assess demographics of the respondents. Additional questions included the usage of Yandex Plus subscription, degree of addiction to the IT products and services as well as perception of cashback.

First of all, the sample that was gathered consisted only from people in the age of 18 to 26 (100%) due to the scope of the current study. More than a half of respondents is presented by female (57,4%). Education variable that will also be used as control variable showed the absolute majority of people holding a higher education degree (73,7%). As for Yandex Plus subscription, majority of respondents (64,2%) are subscribed to this service indicating a good penetration of Yandex ecosystem services.

Table 2.10.

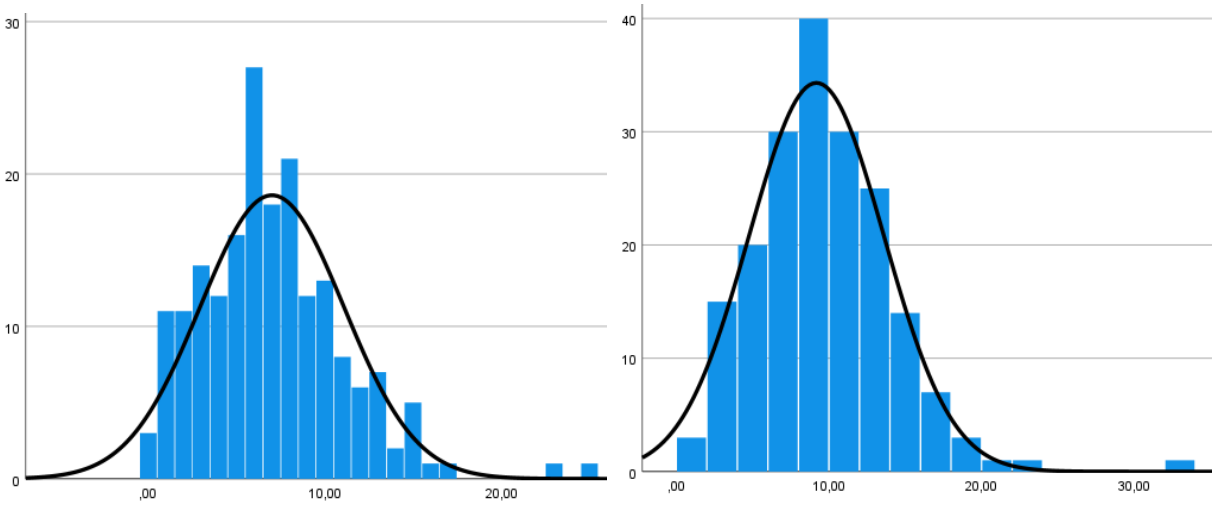
Demographical statistics of data sample

Variable	Value	Frequency	Valid Percent
Age	18-26	210	100%
Gender	Female	109	57,4%
	Male	81	42,6%
Education	Higher edu	140	73,7%
	Unfinished higher edu	40	21.1%
	Medium	10	5,3%
Yandex Plus subscription	No	68	35,8%
	Yes	122	64,2%

The usage behavior variable was captured by suggesting the respondents to rate their usage of each Yandex service from 0 (I don't use it) to 3 (I use it frequently). The usage behavior metric was introduced as control variable in attempt to perform multi-group analysis and distinguish between various levels of value and intention depending on the amount of services used. Statistics show that the mean quantity of services used frequently (FrUs) is 7,01 with standard deviation of 4,07. Respondents additionally rated their rare usage (RaUs), resulting mean of 9,17 with standard deviation of 4,41. The distribution of both variables are shown in figure 2.1.

Figure 2.1.

Frequency distribution for usage behavior variable



Note. Left charts represents number of frequently used services, right chart represents number of rarely used services.

As can be observed from the figure above, both variables shows normal distribution, normality test (Kolmogorov-Smirnov) accompanied the analysis showed significant difference with non-normal distribution. Quantity of services shows that generation Z respondents are highly involved in Yandex ecosystem and use to some extent of frequency use 12,69 services with standard deviation of 5,2. Thus, we can conclude that penetration of Yandex services is substantial and enough for the goals of this study in terms of assessment of integrated value proposition.

2.5 Assumption test

As specified, we determine to test the suitability of our data for structural equation modeling (SEM) from the following assumptions:

(1) Multivariate Normality;

(2) Linearity between constructs

(3) Multicollinearity among latent variables

41 variables were tested for assumptions to compose a EFA, CFA and SEM model.

2.5.1 Linearity

The linearity assumption in structural equation modeling (SEM) posits that the relationships between latent variables are linear, meaning that a change in one variable is directly proportional to a change in the other variable. This assumption is critical because it enables us to use conventional regression techniques to estimate the structural parameters of the model accurately. If the linearity assumption is not met, the estimated relationships between latent variables may not be accurate.

To assess the linearity of relationships between items within factors, we examined multiple scatterplots for each pair of variables within the factors and conducted linearity tests in SPSS. Based on the results of these tests, we decided to delete items IU3 and IU7, as their p-values for the linearity tests were insignificant.

2.5.2 Multicollinearity

Testing for multicollinearity in SEM is crucial for three reasons. Firstly, it can complicate the interpretation of the relationships between latent variables and result in incorrect conclusions. Secondly, it can lead to unstable estimates of the model parameters, making replication of results challenging. Lastly, it can cause inflated standard errors of estimated parameters, reducing the power of statistical tests and making it difficult to detect significant effects.

Figure 2.2.

VIF assessment between variables in the model

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-,231	,292		-,792	,430		
	MeanUV	,058	,082	,057	,713	,477	,503	1,987
	MeanSV	,119	,075	,111	1,590	,113	,662	1,511
	MeanHV	,299	,081	,306	3,665	<,001	,457	2,186
	MeanNV	,228	,070	,215	3,254	,001	,733	1,364
	MeanIN	,223	,050	,256	4,493	<,001	,985	1,015

a. Dependent Variable: MeanIU

Note. All variables corresponds to variables from proposed model.

The assessment of variance inflation factor (VIF) using summated item variables indicated that multicollinearity was not a significant issue in the dataset. We tested each variable as a dependent variable, and the highest VIF value was 2.32, which is lower than the most conservative rule of 2.5 for detecting multicollinearity. (Johnston, 2018).

2.5.3 Multivariate Normality

We evaluated the normality of the data by analyzing skewness and kurtosis, as multivariate normal variables enhance statistical inference. According to Kim (2013), a normal distribution is characterized by a skewness value of less than 2.0 and a kurtosis value that does not exceed 7.0. The skewness values range from -1.27 to 0.54, and the kurtosis values range from -1.25 to 2.49, which fall within the acceptable range. The data can be regarded as symmetrical.

Furthermore, the evaluation of normality was performed by utilizing histogram, Kolmogorov-Smirnov, and Shapiro-Wilk tests. The p-value for all variables was significant at the .001 level, indicating that the variables were normal (Razali, 2011).

Appendix B Table 1 displays the descriptive statistics for each item, which includes standard deviation, skewness, and kurtosis.

CHAPTER 3. DATA ANALYSIS AND RECOMMENDATIONS

3.1 Exploratory factor analysis

The study began by conducting exploratory factor analysis to verify that the items were correctly assigned to their respective factors and to assess the correlation matrices, reliability, validity, and collinearity metrics. The methods used to define and measure variables were based on previous research and literature, ensuring that appropriate metrics were utilized. Certain measurement items underwent modifications in terms of phrasing and translation into Russian, necessitating further examination.

The decision was made to exclude the moderator's latent factors since they are not relevant to the theory being tested. Instead, they are evaluated based on clusters of audience members with low and high mean values.

The initial set of 35 items underwent factor analysis using the maximum likelihood (ML) extraction method. This method was chosen because both confirmatory factor analysis (CFA) and structural equation modeling (SEM) use ML extraction to estimate model fit and regression weights. The factor rotation method used was direct oblimin. This was based on the factor correlation matrix, which indicated that most of the factors were significantly correlated, with correlations greater than 3.

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is.888, and Bartlett's Test of Sphericity has been found to be significant, indicating that sphericity is not a concern for the provided data. We analyzed the KMO statistics for each variable individually and found that all measures were above the.8 threshold, indicating that the sample size for all variables is suitable. The determinant value of 4.786E-10 suggests that there may be multicollinearity in the dataset.

The analysis excluded items with communalities less than.45 (specifically, IU6, IU8, and NV4), and a new factor solution was computed without them. The correlation matrix indicates that most variables are correlated at a level greater than.3, which suggests that the data is suitable for factor analysis.

Several items, including PIIT2, PII4, UV4, SV4, HV2, NV1, and IU12, exhibited cross-loadings or factor loadings below 0.5. Consequently, these items were identified as problematic and were eliminated during the exploratory factor analysis (EFA).

In conclusion, the last group of items attained a Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy of 0.868, and Bartlett's Test of Sphericity confirmed its significance. The communalities of all the variables that were kept had a value greater than 0.5, which is considered acceptable. The factors displayed a moderate-to-low correlation with one another, which suggests

that the measurements are valid. There was no collinearity observed, and the VIF measures were found to be below the threshold of 3 (Mansfield, 1982).

The reliability analysis feature in IBM SPSS software was used to calculate Cronbach's alpha. To improve the scale's Cronbach alpha, certain items (IU9, IU1, and IU11) were removed. All of Cronbach's alpha values exceeded the threshold of 0.7. Assessing the reliability of item measurements

Table 3.1 displays the factor matrix with suppressed loadings of.25, which was derived from the final selection of 20 items.

Table 3.1.

Resulting pattern matrix with reduced item set

Items	Cronbach Alpha	Components					
		1	2	3	4	5	6
UV1		.79					
UV2	.84	.77					
UV3		.76					
PIIT1			.85				
PIIT3	.84		.81				
PIIT5			.81				
PIIT6			.77				
NV2				.86			
NV3	.81			.83			
NV5				.68			
IU2					.83		
IU4	.85				.80		
IU1					.78		
IU5					.71		
SV1						.87	
SV2	.73					.68	
SV3						.62	
HV1							.88
HV4	.86						.72
HV3							.71

Note. Extraction Method: Principal Component Analysis. Direct oblimin rotation method.
a. Rotation converged in 11 iterations. Suppressed loading coefficients <.25;

A six-factor solution was obtained through the maximum likelihood factor extraction method using Kaiser's criterion of eigenvalues greater than 1 after variable treatment (Field, 2009).The explained variance is 73% and the eigenvalue is .909. The pattern matrix demonstrates that the variables are well-organized according to theoretical factors, and there are no significant cross-loadings of factors (> .25), as per MacCallum's (1999) criteria. Thus, it can be inferred that the

arrangement of variables in the data-set adheres to the theoretical framework, and the ultimate set of variables effectively and significantly assesses the constructs they are intended to evaluate.

3.2 Confirmatory Factor Analysis (CFA)

3.2.1 Measurement model and model fit

In a CFA, it is possible to define the measurement model for each score and evaluate whether the collected data aligns with the theoretical model. According to Heene (2011), if the concept of local independence and unidimensionality is valid, the test score's measurement model must not have correlated errors or loadings from other latent variables. When a test confirms such a model, it is typically inferred that the items are measuring only one underlying dimension.

We utilized the SPSS AMOS software package to perform a confirmatory factor analysis (CFA) to evaluate the measurement model's adequacy. We examined the discriminant validity, convergent validity, and extracted variance, as well as the square mean correlation. The measurement model is presented in Figure 1 of Appendix C.

To validate and confirm the factorial structure of variables identified in the exploratory stage, we conducted a confirmatory factor analysis (CFA) using both the full set of variables and a reduced set of variables identified through exploratory factor analysis (EFA).

The initial solution, which included all variables, yielded the following fit indices: RMSEA (.64), GFI (.773), CFI (.876), and TLI (.864). Therefore, it can be inferred that the original model containing all variables exhibits inadequate conformity based on Hu and Bentler's (1999) evaluation. The standardized regression weights of factor items were analyzed with a cut-off point of.7. The results were consistent with the findings of exploratory factor analysis (EFA). Items that were not considered important during EFA had either insignificant loadings or were associated with multiple factors or error covariances with errors from other factors. This confirms that the initial full set of variables did not meet the test for unidimensionality. Consequently, we conducted a new analysis using a smaller set of variables that were identified during the exploratory factor analysis (EFA).

The model with fewer items displayed a noteworthy improvement in fit, indicating that it fits the dataset very well. Table 3.2 displays the fit indices.

Table 3.2.

Resulting fit indices for measurement model

Measure	Threshold[a]	Estimate	Fit Conclusion
PCMIN/DF	<3	1.471	Excellent
GFI	>.95	.893	Acceptable
CFI	>.9	.962	Excellent
TLI	>.9	.953	Excellent
RMSEA	<.06	.050	Excellent
Pclose	>.05	.491	Excellent
	Threshold[b]		
AGFI	>.8	.855	Acceptable
RMR	<.1	.57	Not acceptable
NFI	>.9	.904	Acceptable
IFI	>.9	.962	Excellent
RFI	>.85	.867	Acceptable

Note. [a]Hu & Bentler (1999); [b]Gaskin (2023); CMIN: $\chi 2$ value; DF: degrees of freedom; CMIN/DF: relative $\chi 2$ value; CFI: Comparative Fit Index; GFI: Goodness-of-fit Index; TLI: Tucker-Lewis; RMSEA: Root Mean Square Error of Approximation; PCLOSE: p of Close Fit.

The unidimensionality test for a reduced set of variables can be examined along with an evaluation of its factorial validity. The study evaluated the EFA outcomes and examined the presence of correlated errors among factors and cross-loadings. The absence of multidimensionality issues is indicated by the lack of significant correlation among errors and no significant loading of items beyond the cut-off of >.3 on other variables. This is the initial evidence of such absence.

To support the rationale for merging value dimensions (such as usefulness value, social value, hedonic value, novelty value) into a single second-order factor, various models were evaluated for fit indices. These models included first-order factor CFA, second-order factor CFA, and second-order with summated items. The outcomes are visible in Table 3.3.

Table 3.3.

Fit-indices model comparison

Model	CHI/df	RMSEA	GFI	CFI	TLI	Pclose	Chi	df
First order factor CFA	1.471	.05	.893	.962	.953	.491	227,935	155
Second order factor CFA	1.458	.049	.891	.961	.954	.525	237,603	163
Second order with summated items	1.695	.061	.929	.963	.953	.205	86,437	51

The comparison of fit indices indicates that the second order model with summated items had the poorest fit among all other models, with the highest CHI/DF value and the lowest P-close statistics. The GFI has shown significant improvement at a level of 0.929, which is typically observed when the number of connections is reduced. Steiger (1990) showed that the GFI index exhibits a favorable inclination towards the ratio of sample size to degrees of freedom.

The optimal models for the data were found to be a first-order factor solution and a second-order factor solution. Both shows a good fit for RMSEA with a value of less than 0.5. Additionally, both shows acceptable values for GFI, which is greater than 0.890, and TLI, which is greater than 0.950. It is noteworthy that the P-close value is below the .5 threshold for the initial factor level.

Despite the comparable fit indices of both models, it is generally anticipated that a less intricate model would exhibit significantly superior model indices. The chi-square comparison test indicated no significant differences at a p-value of .01, leading to the conclusion that the models are invariant. As per Wright's (2012) recommendation, it is advisable to incorporate the simplest models when there are no significant variations in the model fit indices. The comparison of model fit supports the theoretical model with second order factor solutions. Subsequently, stages of CFA will be performed using the second order measurement model depicted in Figure 2 of Appendix C.

3.2.2 Common method bias

The data was collected through a single tool, which was an online form distributed among the target audience via social media and messaging platforms. The existence of common method bias can undermine the outcomes and conclusions of the model.

When evaluating common method bias, it is crucial to note that certain researchers, such as Richardson (2009), contend that ad-hoc analyses of CMV rely on correlations between constructs and are not defensible because they may measure a variable that is absent from the theoretical framework. The author contends that the marker variable technique is the sole method suitable for

estimating CMV. However, since the marker variable was not included in the research design, we will utilize the available post-hoc methods.

We will use several standard techniques to evaluate the existence and extent of common method variance (CMV).

Harman's single factor test indicated that a single factor solution with no rotation accounted for 27% of the explained variance. This suggests that there were no issues with common method bias, as the percentage was below the 50% cut-off point. Harman's rule is frequently utilized in academic research, although it has been subject to significant criticism. Currently, the technique is solely employed for evaluating the problematic presence of CMB.

The next criterion is the common latent factor (CLF) approach, as described by Gaskin, Lim, and Steed (2022). This method involves an extra hidden variable that is made up of all the elements in the model. The purpose is to assess the shared variability among all items, disregarding variations between factors. Typically, when CMV is measured, researchers will compare the standardized regression weights of a model that includes CMV to those of a model that does not include CMV. According to common belief, a significant common method bias (CMB) exists in the data if the discrepancies among regression weights exceed 0.2. After examining the differences in regression weights, it was found that there were no differences greater than the .2 level. Therefore, it can be concluded that there are no issues related to Common Method Variable method when using this approach.

Lindell (2001) suggests that if a marker variable was not included in a research study, the smallest correlation between variables can be used to determine the amount of variance explained by method error. As per this regulation, the minimum correlation between factors is 0.076, which suggests that CMV explains an acceptable amount of variability.

Based on our ad-hoc analyses, we can infer that the CMV is not a significant concern in the model. However, it is necessary to acknowledge this limitation and address it accordingly. This is because the marker variable was not included in the research methodology beforehand, which prevents us from drawing conclusions about the reliability of the assessment for common method bias in our data. Richardson's work from 2009.

In order to obtain results that are adjusted for common method bias, it is standard practice to incorporate the CLF variable when conducting research and structural modeling. For the purpose of visual clarity, it will be omitted from measurement models and other figures.

3.2.3 Discriminant validity

Discriminant validity was assessed in order to examine cross-factor correlation matrixes and conclude about reliability and validity of measurement items. Resulting table is presented below:

Table 3.4.

Resulting validity indices for latent factors

Construct	Item	SRW	SMC	Mean	St. Dev	CA	CR	AVE
Consumption value	HV	.88	.77	3,77	.89	.8	.86	.61
	SV	.77	.59	3,24	.80			
	NV	.63	.40	3,24	.82			
	UV	.84	.70	3,92	.84			
Innovativeness in IT domain	PIIT1	.74	.54	3,16	1.23	.84	.84	.57
	PIIT3	.80	.64	3,11	1.22			
	PIIT5	.75	.56	2,35	1.11			
	PIIT6	.75	.56	2,98	1.27			
Usefulness value	UV3	.84	.70	3,95	.97	.84	.84	.64
	UV2	.82	.67	3,88	.97			
	UV1	.74	.54	3,94	.98			
Social value	SV3	.69	.47	3,41	.94	.73	.75	.51
	SV2	.84	.71	3,47	.87			
	SV1	.59	.35	2,84	1.15			
Hedonic value	HV3	.92	.84	3,64	1.01	.86	.90	.75
	HV1	.80	.65	3,91	.95			
	HV4	.88	.78	3,77	.97			
Novelty value	NV5	.64	.41	2,98	.95	.81	.80	.58
	NV2	.83	.69	3,31	.99			
	NV3	.80	.64	3,44	.98			
Intention to use	IU5	.72	.52	2,41	1.07	.85	.85	.58
	IU4	.74	.55	3,04	1.06			
	IU2	.74	.55	2,72	1.03			
	IU1	.85	.71	3,41	1.03			

Note. SRW – standardized regression weights; SMC – squared multiple correlation; CA – Cronbach Alpha; CR – convergent reliability, AVE- average variance extracted

It can be seen from the table above that all variables have significant regression weights larger than cut-off value of .5 (Cho, 2020). Dimensions of consumption value, namely SV, HV, NV, UV also have significant loading on the CV. Next, all constructs were tested for convergent validity. Convergent validity was confirmed by Composite Factor Reliability calculation (CR), all factors demonstrated values above the minimum requirement of 0.7. Average Variance Extracted (AVE) was above 0.6 for all constructs, exceeding the threshold of 0.5 (Hair, 2017).

For further CFA analysis all the constructs should be assessed for discriminant validity. We measured the square root of each construct's AVE to assess discriminant validity (see Table 3.5).

Table 3.5.

AVE and SRC assessment table

Var	AVE	IU	IN	CV
IU	.582	**.763**		
PIIT	.574	.362	**.757**	
CV	.612	.683	.110	**.784**

Note: CV – consumption value; PIIT – Innovativeness; IU – Intention to use. The bold numbers in the diagonal row are square roots of the average variance extracted.

These square roots were larger than the correlations between the constructs, which confirmed the discriminant validity (Tsang, 2002). This indicates that there is a valid difference between the constructs and they are explained by the different dimensions.

In order to cross-validate the inferences drawn from Fornell and Larcker test (1981), we proceed to the heterotrait-monotrait ratio of correlations criterion which effectiveness was demonstrated by Henseler (2015). According to this criterion – If the HTMT value is below 0.9. discriminant validity has been established between two reflective constructs. For stricter assessment 0.85 level value is considered. Estimations are shown in Table 3.6.

Table 3.6.

Heterotrait-monotrait ratio analysis

	IU	IN	CV
IU			
IN	.318		
CV	.581	.112	

Note. CV – consumption value; IN – Innovativeness; IU – Intention to use.

All HTMT values for latent variables shown to be way below the threshold level, thus additional method confirms discriminant validity between proposed constructs.

The presented CFA results showed that the measurement model met all the requirements and provides acceptable and valid model fit. CFA analysis confirmed the factorial structure of variables within the data-set, the performed analyses for convergent validity, variance and discriminant

validity showed that the factors within the model are consistent, distinctive and reliable. Common method bias assessment showed absence of issues. Thus, based on CFA results, we can conclude that the data and factors are appropriate for structural equation modelling and it is possible to proceed with it.

3.3 Structural equation modelling

3.3.1 Model testing

In order to compare second order factor model and first order factor model without inclusion of multifaceted Consumption Value, next we compare both models and assess their explanatory power as well as parsimony. The results of models' comparison is shown in the Table 3.7.

Table 3.7.

Results of second-order and first order model comparison

	Standardized effect		Regression weights			
	IU R^2	Total-Direct	Estimate	S.E.	C.R.	p
Model 1 - separately	.39					
PIIT → NV		.146	.146	.068	1.842	.066
PIIT → HV		.127	.127	.074	1.606	.108
PIIT → SV		.13	.13	.066	1.639	.101
PIIT → UV		.126	.126	.07	1.598	.11
PIIT → IU		.428	.321	.066	4,048	***
UV → IU		.067	.067	.062	1.003	.316
SV → IU		.137	.137	.066	2.045	.041
HV → IU		.372	.372	.061	5.398	***
NV → IU		.231	.231	.065	3.404	***
Model 2 - CV	.55					
PIIT → CV		.116	.116	.047	1.335	.182
CV → IU		.649	.649	.159	6.945	***
PIIT → IU		.361	.286	.065	4.037	***

Note. S.E. – standardized error; C.R. – critical ratio; p – pvalue

The following table shows that multi-faceted second order value explains more variance in intention to use new services of Yandex ecosystem than separated dimensions of value. R^2 for CV model is .55 and for separate model is .39.

Chi square test difference shows invariance between models with p-value of .368. However, the model without CV all others fixed should indicate better fit (Hair, 2009). Moreover, CV model is more parsimonious, thus we decide that there is a presence of synergetic effect and that Consumption value for ecosystem services can explain large portion of variation in intention to use – .55 (Hair, 2009).

Thus, according to the analysis of CFA and model comparison, it can be inferred that **hypothesis 1** along with H1a, H1b, H1c, H1d are validated. Hedonic Value (HV), Novelty Value (NV), Social Value (SV), and Usefulness Value (UV) are unique aspects of a Consumption Values (CV). The inclusion of these facets in a CV enables a greater explanation of variance in R^2 compared to a model with separate value dimensions. This suggests a synergistic effect, where the sum of dimensions better explains the variance in IU than individual effects.

Hypothesis 2 aimed to investigate the difference in R^2 values between the two models: Model 1, which included separate dimensions of value, and Model 2, which included the multifaceted CV construct. The results of the SEM analysis revealed a significant difference in R^2 values between the two models ($\Delta R^2 = .16$, $p < .01$), providing support for Hypothesis 2. This indicates that the inclusion aggregated multidimensional value improves the explanatory power of the model, explaining an additional 12% of the variance in the dependent variable.

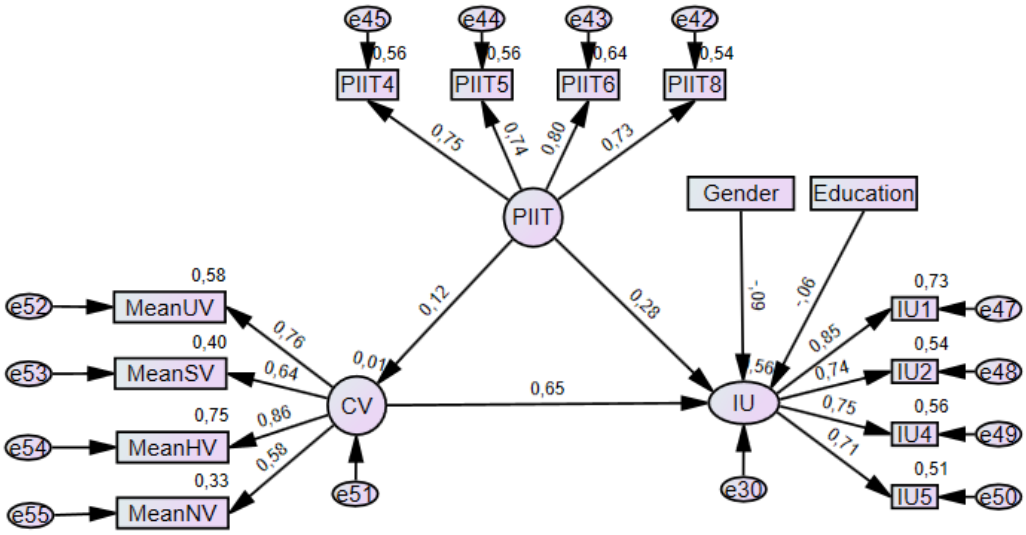
3.3.2 Direct path hypothesis testing

After exploring and confirming the factorial structure of variables and assessing the reliability and validity metrics, we can move to the hypothesis testing and modelling of structural relationship between variables of interest.

As it was stated previously, we use Intention to use (IU) variables as DV and Consumption value (CV) and product innovativeness in IT domain (PIIT) as IV. Moreover, previous research also assumes that innovativeness mediates the effect of Consumption Value on Intention to use. Additionally, moderating effects of addiction behavior, Loyalty incentives will be explored through multi-group analysis. The model will also include the control variables such as gender and education. The final model that was built using SPSS AMOS software package with standardized coefficients is presented in Figure 3.1.

Figure 3.1.

SEM model with standardized coefficients



Next, it is needed to state the validity and measures of fit for this structural model was estimated. The following indices in the Table 3.8 summary proved that this structural model is considered valid, meets all the requirement of model fit thresholds and can be used for further results interpretation:

Table 3.8.

Structural equation model fit

Measure	Threshold[a]	Estimate	Fit Conclusion
CMIN/DF	<3	1.458	Excellent
GFI	>.95	.889	Acceptable
CFI	>.9	.961	Excellent
TLI	>.9	.954	Excellent
RMSEA	<.06	.049	Excellent
Pclose	>.05	.525	Excellent
	Threshold[b]		
AGFI	>.8	.857	Acceptable
RMR	<.1	.061	Acceptable
NFI	>.9	.887	Poor
IFI	>.9	.961	Excellent
RFI	>.85	.868	Acceptable

Note. aHu & Bentler (1999). bGaskin (2019); CMIN: χ2 value; DF: degrees of freedom; CMIN/DF: relative χ2 value; CFI: Comparative Fit Index; GFI: Goodness-of-fit Index; TLI: Tucker-Lewis; RMSEA: Root Mean Square Error of Approximation; PCLOSE: p of Close Fit.

Further, the hypotheses regarding direct relationship from the Chapter 1 will be addressed step by step. First step of the modeling was to test the effect of the consumption value and product innovativeness in IT domain (IV) on the intention to use new services of Yandex Ecosystem (DV). The point here is to address the direct effects without taking into account the mediation influence or moderation. Calculating the path estimates the regression weight results come as follows:

Table 3.9.

SEM hypothesis testing

Hypothesis	St.Estimate	S.E.	C.R.	P-label	Decision
H3: Consumption Value → Intention To Use	.665	.133	7.051	***	Supported
H4: Innovativeness in IT → Intention To Use	.298	.063	4.236	***	Supported
H5: Innovativeness in IT → Consumption Value	.110	.055	1.266	.206	Rejected

Note. *** - significant at .001 level

The **hypothesis 3** aimed to examine the relationship between consumption value (independent variable) and intention to use (dependent variable). The regression analysis revealed a significant and positive relationship between the two variables, with a beta coefficient of .665 ($p < 0.001$). The beta coefficient of .665 indicates that for every one-unit increase in consumption value, there is a corresponding increase in intention to use. The p-value less than 0.001 suggests that this relationship is statistically significant, providing strong evidence to support the hypothesis. These results indicate that consumption value has a substantial impact on individuals' intention to use. Higher levels of consumption value are associated with a greater likelihood of intending to use the product or service under investigation.

The **hypothesis 4** aimed to investigate the relationship between product innovation in the IT domain (independent variable) and intention to use (dependent variable). The regression analysis revealed a significant and positive relationship between the two variables, with a beta coefficient of 0.298 ($p < 0.001$).The beta coefficient of 0.298 indicates that for every one-unit increase in product innovation in the IT domain, there is a corresponding increase in intention to use. The p-value less than 0.001 suggests that this relationship is statistically significant, providing strong evidence to

support the hypothesis. These results suggest that product innovation in the IT domain has a meaningful impact on individuals' intention to use. Higher levels of product innovation are associated with a greater likelihood of intending to use the IT product or service under investigation. The findings highlight the importance of product innovation in driving users' intentions to adopt and utilize IT solutions.

The **hypothesis 5** aimed to investigate the direct effect of PIIT on CV, while the **hypothesis 6** aimed to examine the mediating relationship between product innovation in the IT domain (independent variable) and the consumption value of Yandex ecosystem services (mediating variable) on intention to use (dependent variable). The analysis revealed a beta coefficient of direct effect of .055 with a p-value of 0.206. The beta coefficient of .055 suggests a positive relationship between product innovation in the IT domain and the consumption value of Yandex ecosystem services, although the magnitude of the relationship is relatively small. However, the p-value of 0.206 indicates that the relationship is not statistically significant at the conventional significance level of 0.05. These results suggest that there may be a weak association between product innovation in the IT domain and the consumption value of Yandex ecosystem services, but it is not strong enough to reach statistical significance. In other words, the level of product innovation does not have a substantial impact on individuals' perception of the value they derive from using Yandex ecosystem services, according to the data analyzed. Therefore, in a situation of absence of direct effect of PIIT on CV, we conclude that the mediating effect of CV on relationship between PIIT on IU is not present as well, thus the **hypotheses 5 and 6 are rejected**. It is important to note that the non-significant p-value (0.206) indicates that the observed relationship may be due to chance rather than a true effect. Further research with a larger sample size or different methodologies may be necessary to gain more conclusive insights into the relationship between product innovation in the IT domain and the consumption value of Yandex ecosystem services.

Additionally, control variables were assessed: all estimates showed insignificance with p-value higher than .05 level. Analysis of effect of control variables on CV, IU, IN showed absence of significant effect, all p-values showed to be >.05 level. Thus, we can conclude that there is no effect of education and gender on intention to use new services of Yandex ecosystem.

3.3.3 Multi-group analysis

Grouping variables

To further test the developed hypothesis about moderating role of digital addiction (DA), Loyalty incentives (LI) and subscription to Yandex Plus (YP) on relationship between value and intention to use. Previously, in methodological part we covered the process of group creation and statistical differences.

Additional group includes observed usage of subscription to Yandex Plus service. Previously in study on Amazon prime (Ramadan, 2021) the effect of such subscription was studied, therefore we intend to repeat the research and apply it to another ecosystem as it was stated in literature review.

Moderation multi-group

Due to the nature of research design and the existence of multi-faceted second order factor, we can not model the interaction effect, because that would require summated CV variables that is already composed of summated items of UV, SV, NV, HV. Therefore, the better and more appropriate method in our situation is to perform multi-group analysis for the variables of interest.

Table 3.10.

Multi-group model comparison results

High and low groups	Unconstrained		Constrained		P-value
	CMIN	df	CMIN	df	
Yandex Plus	155,472	104	186,936	115	***
Loyalty incentives	14.257	104	153,124	115	.302
Digital addiction	136,674	104	147,488	115	.458

Note. *** - significant at .001 level; CMIN - $\chi 2$ value; df – degrees of freedom.

Firstly, for each pair of groups unconstrained and constrained model were compared in order to assess the invariance and its significance between two models. Only groups for Yandex Plus showed difference at the model level. Loyalty incentives (LI) and digital addiction (DA) did not show significance at the model level, which can be seen in the table 3.11. P values for these groups were substantially higher than .05 level. Therefore, it is needed to assess the group differences fixing each regression weight to be equal among the models. The results of each path comparison between two groups are shown in the table 3.11 below:

Table 3.11.

Multi-group path comparison results

High and low groups	Path, χ2 dif. Sig					
	CV→IU	IN→IU	CV→UV	CV→SV	CV→HV	CV→NV
Yandex Plus	**	**	n/s	ref	n/s	*
Loyalty incentives	n/s	n/s	n/s	ref	n/s	*
Digital addiction	n/s	n/s	n/s	ref	n/s	*

Note. ** - significant at .05 level; * - significant at .1 level; n/s – not significant; ref – reference path fixed to one.

The **hypothesis 8** aimed to examine the moderating effect of subscription to Yandex Plus on the relationship between consumption value and intention to use new ecosystem services. The results of the structural equation modeling (SEM) multi-group analysis revealed contrasting beta coefficients for the two groups: subscribed individuals to the Yandex ecosystem and non-subscribers.

For the group of subscribers to Yandex ecosystem, the beta coefficient of the relationship between consumption value and intention to use was found to be 0.75. This indicates a strong and positive relationship between consumption value and intention to use new ecosystem services among subscribers. On the other hand, for the group of non-subscribers, the beta coefficient of the same relationship was 0.54. Although still positive, this coefficient suggests a weaker relationship between consumption value and intention to use among non-subscribers compared to the subscribed group. These results provide evidence that subscription to Yandex Plus moderates the effect of consumption value on intention to use new ecosystem services. Subscribed individuals, who likely have access to additional benefits and features offered by Yandex Plus, exhibit a stronger relationship between their perception of consumption value and their intention to use new ecosystem services.

In contrast, non-subscribers, who do not have the same level of access and benefits, show a comparatively weaker relationship between consumption value and intention to use.Next, innovativeness effect on intention to use showed significant difference for two groups who use Yandex Plus subscription and those who do not. The CV-SV path is not included in comparison as this path is constrained to one in order for the model to be identifiable. Additional finding is that for all group pairs except for addiction behavior there is a significant difference in path from consumption value to novelty value.

Product innovativeness in IT domain showed significant difference with initial model for subscribers of Yandex Plus. For those that are subscribed to Yandex Plus IN → IU β=.45 and for

those that are not subscribed to Yandex Plus β=.05. Additionally, β coefficient for NV to CV path equals .65 for subscribers and .42 for non-subscribers, however the significance is at .1 level, which is not appropriate in terms of the alpha level of this study. Moreover, the CV→IU path is moderated by the subscription to Yandex Plus as β for subscribers equals .72 and β for non-subscribers equals .53

The group comparison between those who have a positive perception of Yandex Loyalty incentives (high group) and those who have less positive perception (low group) is failed to provide any significant differences in the model. The same situation can be seen testing group of highly addicted to e-services people versus those who don't consider themselves addicted.

Thus, even though additional findings were provided during the multi-group analysis, we can conclude that **Hypotheses 8 and 9** are rejected and thus Digital addiction, Loyalty incentives do not moderate the relationship between CV and IU.

The results of hypothesis evaluation are presented in table 3.12:

Table 3.12.

Summarized hypothesis testing resulted

Hypothesis	Decision
H1: The four constructs (UV, SV, HV, and NV) represent distinctive facets of consumption value (CV).	supported
H1a: Usefulness value (UV) is a distinctive measure of consumption value (CV).	supported
H1b: Hedonic value (HV) is a distinctive measure of consumption value (CV).	supported
H1c: Social value (SV) is a distinctive measure of consumption value (CV).	supported
H1d: Novelty value (NV) is a distinctive measure of consumption value (CV).	supported
H2: Consumption value (CV) positively influences the intention to use new services of the Yandex ecosystem (IU).	supported
H3: The second-order CV model exhibits greater explanatory power for intention to use compared to the first-order model.	supported
H4: Product innovativeness in IT domain (PIIT) positively influence intention to use new services of Yandex ecosystem services (IU);	rejected
H5: Consumption value (CV) mediates the effect of innovativeness on intention to use new services of Yandex ecosystem services (IU).	rejected
H6: Digital addiction moderates the effect of consumption value on intention to use new ecosystem services.	rejected

H7: Subscription to Yandex Plus moderates the effect of consumption value on the intention to use new ecosystem services.	supported
H8: Loyalty incentives moderate the effect of consumption value on the intention to use new ecosystem services.	rejected

3.4 Discussion and implications

The following paragraph is devoted to the discussion of research findings, explanation of outcomes of supported and rejected hypothesis with resulting theoretical contribution after that. Next, the managerial implications for practitioners within digital business ecosystems were formulated based on the findings of the research.

3.4.1 Research findings

The aim of this study was to explore the factors of perceived value of digital business ecosystem and extent to which it affects the intention to use new services among how Generation Z. The objects were formulated in order to capture unique characteristics of Gen Z and explore influence the perceived value formation towards the ecosystem as a collection of complementary offerings, each contributing its own value to the overall perception of the ecosystem, which in turn affects the intention to use new services within the ecosystem. Additionally, the study examined the contribution of tools employed by the ecosystem to enhance user loyalty, value, and interaction with different services. Users of the Yandex ecosystem, representing Generation Z, were surveyed regarding their perception of the ecosystem as a whole, as well as their usage of specific ecosystem services.

The examined dimensions of value, namely usefulness value, novelty value, hedonic value, and social value, showed significant regression weights on consumption value. All dimensions demonstrated excellent statistical validity and reliability results. The regression weights for novelty value and social value were found to be the lowest for the average respondent, with regression weights of 0.58 and 0.64, respectively. This suggests that these dimensions are perceived as weaker compared to hedonic and usefulness dimensions, which had regression weights of 0.86 and 0.76, respectively. Importantly, the multi-group analysis revealed that the ratios of regression weights for value dimensions varied significantly among different customer groups. This indicates that customers perceive the value of the ecosystem differently, and the structure of regression weights serves as a useful marketing indicator.

Furthermore, the hypothesized effect of value on intention was found to be significant at a level of 0.55. This means that a one standard deviation increase in consumption value results in a

0.55 increase in intention to use. This finding supports previous applications of Total Customer Value (TCV) in other contexts and confirms its applicability within the ecosystem context as well.

Firstly, through this study, we aimed to explore the aggregate value proposition by applying a multi-faceted second-order model for consumption value. By comparing the models, we found that the multi-dimensional model had greater explanatory power (R^2=.55) on intention to use compared to the unidimensional model (R^2=.39). This finding justifies the use of consumer value theory in relation to the ecosystem, and the validation and reliability testing of constructs confirm this conclusion. As a result, we can conclude that users of the ecosystem perceive the value of the ecosystem through the usefulness value, social value, hedonic value, and novelty value of the services they use within the ecosystem, and together, these dimensions explain 55% of the intention to use new ecosystem services.

The direct effect of product innovativeness in the IT domain on intention to use showed a significant and high effect size (.298), confirming hypothesis and aligning with previous studies. Interestingly, a change of 1 standard deviation in innovativeness leads to a change of 0.3 standard deviation in intention to use, indicating a high effect size.

Secondly, the mediating role of consumption value on the effect of customer innovativeness in the IT domain on intention to use was examined, in line with previous research (source). The study rejects the hypotheses regarding the effect of innovativeness on intention through the mediating role of consumption value, which contradicts prior research on this topic. This fact can be explained through two approaches.

Firstly, most studies focus on the context of innovative products, whereas the Yandex ecosystem, as indicated by the regression weight of novelty value (.58), which contributes the least to the overall value compared to other dimensions. Therefore, as consumers do not perceive significant innovativeness in the Yandex ecosystem, changes in customer innovativeness do not lead to an increase in the ecosystem's value.

Secondly, the absence of a mediating role may also reflect the uniqueness of Generation Z as a generation that is inherently more innovative in terms of adopting new IT technologies and services. From the perspective of novelty and uniqueness of technologies, it becomes harder to impress and provide value to the segment of innovators. This fact questions the standard theory of individual adoption, which states that early adopters will buy new products simply because they are novel.

Additionally, since numerous studies have raised the issue of technology dependence, especially among Generation Z, and have investigated this latent variable in the context of the Technology Acceptance Model, the hypothesis of addiction moderating the relationship between

value and intention was examined. The proposed hypothesis was rejected. Previous research indicates that addiction significantly affects perceived playfulness and perceived usefulness, but these studies focused on services and technologies aimed at eliciting emotions or providing information. Most services within the considered ecosystem are goal-oriented and do not involve traits of addiction, which may explain the discrepancy in findings between previous studies and the current research. Applying this latent variable to social media-based ecosystems or information services such as VK or YouTube is more likely to yield significant results.

Thirdly, the moderating role of ecosystem tools that contribute to increased cohesion between services from the perspective of customer flow was examined, such as multi-service subscriptions and loyalty incentives in the form of cashback. Multi-group analysis comparing subscribed and non-subscribed users of Yandex Plus revealed that the presence or absence of a subscription indeed moderates the relationship between consumption value and intention to use. For subscribed users, the effect size of beta (CV→IU) was 0.75, while for non-subscribers, it was 0.54. This finding empirically validates the conceptual findings of previous research and confirms that a multi-service subscription enhances the perceived value of the ecosystem and increases the intention to use new ecosystem services, thereby promoting a vital parameter of ecosystem well-being, which is the exchange and flow of users from one service to another.

Furthermore, loyalty incentives in the form of cashback, which are utilized by many ecosystems, were examined within the same context. Previous research focused on measuring the role of loyalty incentives in continuance intention. However, in this study, the hypothesis regarding the moderating role of perception of cashback loyalty incentives on the relationship between consumption value and intention to use e-services in the digital business ecosystem was rejected. The characteristics of our sample, comprised exclusively of Generation Z respondents, likely contributed to the lack of significance in this moderation effect. The distinct preferences, attitudes, and experiences of Generation Z individuals, coupled with their unique digital behavior, could have influenced their perception and response to cashback offers differently. Moreover, previous studies on loyalty incentives were conducted a considerable time ago, and since then, the environment and customer perceptions have changed (Naidoo, 2007). Nowadays, consumers, especially tech-savvy Generation Z, do not perceive much value in cashback incentives.

In conclusion, we can state that the Theory of Consumption Values, accompanied by the innovativeness of Generation Z and complemented by tools that provide ecosystem cohesion and influence complementarity, holds significant explanatory power in explaining consumer behavior towards digital business ecosystems. This finding has numerous practical implications for decision-makers as well as important theoretical contributions, which we will discuss further.

3.4.2 Theoretical contribution

This research study has made significant contributions to the field of consumer behavior and strategy, specifically in the field of digital business ecosystems and the impact of perceived value on the intention to use new services. By examining theories such as consumption values, business ecosystems, digital addiction, and individual innovativeness, this study has deepened our understanding of these theories and their relevance when applied to Generation Z consumers and ecosystems.

In this study, we employed several theories. Firstly, we utilized the theory of business ecosystems, initially proposed by Moore, to differentiate business ecosystems from other ecosystems and understand the unique characteristics and criteria of product-based digital business ecosystems. Previous authors who expanded the theory of business ecosystems emphasized the need for empirical and quantitative research, which we addressed by employing quantitative multivariate analysis, specifically structural equation modeling, to gain valuable insights into customers' perception of value within the ecosystem.

Furthermore, numerous researchers studying business ecosystems have emphasized the importance of aligning value propositions with customers' needs and developing integrated value propositions tailored to different customer requirements. We bridged the gap between supply-dominant perspectives, such as the value chain, and a demand-oriented value creation perspective, which is more relevant in business ecosystems. By applying the theory of consumption values, we compared the ecosystem's value proposition with customers' perceived value, leading to findings that validated the applicability of certain dimensions of consumption value to business ecosystems. The positive correlations between these constructs and overall consumption value provided empirical evidence supporting the validity of the theory. Additionally, the confirmed positive impact of consumption value on the intention to use new ecosystem services offered empirical support for the theory in a new context, highlighting the significance of creating value for consumers within digital business ecosystems, which has a strong explanatory power for intention to use new services.

Another significant contribution of this study is its perspective on Generation Z, in accordance with the theory of generations. We examined the influence of individual innovativeness on perceived value and its subsequent impact on the intention to use new ecosystem services. Previous studies have often found a mediating role of value in the relationship between innovativeness and intention to use; however, our findings indicated a direct effect of innovativeness on the intention to use. The rejection of the hypothesis regarding mediation is an important finding, suggesting that the influence of individual

innovativeness on behavioral intentions and actual behavior may differ for Generation Z compared to other generations. This underscores the need to consider the unique characteristics of Generation Z consumers, who are inherently inclined to adopt new IT technologies and services.

Additionally, we made a modest contribution to the theory of digital addiction, which was first introduced by Young and further developed by subsequent studies. By rejecting the hypothesis regarding the influence of digital addiction on value and intention, we narrow down the scope to focus future research efforts on other e-services, such as social media and information services, where digital addiction is more prevalent and significantly affects intentions.

Lastly, our research aligns with the emphasis in business ecosystem studies on the interconnectedness and synergies between services. This can be achieved on the supply side through data exchange among ecosystem actors and on the demand side through loyalty programs and multi-service subscriptions. We assessed the contribution of multi-service subscriptions and concluded that they indeed play a significant role in the relationship between value and the intention to use. However, in the case of cashback incentives, we did not find any significant relationship, indicating that the perception of cashback differs for Generation Z compared to other generations.

In summary, this research contributes to the outlined theories by providing empirical evidence, refining their application within the context of Generation Z consumers, and uncovering novel insights into the factors that influence the intention to use new services in digital business ecosystems. These contributions advance our theoretical understanding and have practical implications for decision-makers aiming to enhance consumer engagement and drive the adoption of new ecosystem services.

3.4.3 Managerial implications

The presented research paper, which includes a literature analysis on business ecosystems, consumer value theory, and quantitative research on value dimensions, focuses on a crucial aspect of ecosystem management and development: the formation of an integrated customer-facing value proposition within the process of creating and reconfiguring a large number of complementors and achieving cohesion and synergetic value configuration. This, in turn, influences the usage, loyalty, and sales within the ecosystem services.

The primary function of any ecosystem is value creation. In business ecosystems, value is created through attracting new partners, creating new business units, or introducing new functions within existing ecosystems. Naturally, there is a need for a measurement tool for value in order to provide a balanced value proposition aligned with the organization's strategic objectives. The presented research paper proposes four dimensions of ecosystem value:

Usefulness value: The perceived capability provided by the business ecosystem.

Social value: The extent to which the usage of ecosystem services differentiates one's social perception.

Novelty value: The perceived level of novelty and uniqueness of the business ecosystem.

Hedonic value: The feelings of pleasure, satisfaction, and comfort towards the business ecosystem.

These dimensions were applied to a digital business ecosystem such as Yandex. The main result is that the combined dimensions of value can, firstly, provide insights into the strengths and weaknesses of the business ecosystem in terms of perceived value and, secondly, the research findings showed that the aggregated value can explain 55% of the intention to use new ecosystem services, which is an important objective for any ecosystem.

Understanding the strengths and weaknesses of the business ecosystem from the perspective of perceived customer value can provide decision-makers with several important perspectives. Firstly, one of the most important processes in an ecosystem is offering assembly activities. It requires changing the structure of actors to gain additional knowledge leveraging capabilities from the traditional point of view. Also considering DBE perspective, to make informed decisions about modifying the current offering through the reconfiguration of actors that will bring new value for customers.

Therefore, when making decisions about integrating new complementors, creating a new business unit, or adding a new service, the value dimensions of the ecosystem can be evaluated, and the value dimensions of the new partner, business unit, or service can be quantitatively assessed to make decisions that strengthen the position of the business ecosystem from the perspective of its clients.

Furthermore, understanding the quantitative distribution of dimensions of value, overall perceived value, and intention to use among different segments of the target audience can also serve as important informational support for tailoring offerings to these segments.

Thirdly, understanding the strengths and weaknesses in terms of value perception can also provide additional input for communication strategies of value propositions to customers. For example, the strong dimensions of value for Yandex are usefulness and hedonic values. Communication strategies can emphasize the capabilities that Yandex services provide. From a weakness perspective, if the goal was to increase social value, Yandex could have allocated a larger budget for promoting social information services like Dzen, which acts as a mediator and serves the purpose of connections. Alternatively, company realized that social services are not the strategic foundation for the ecosystem's goals and sold it.

An additional perspective opened up by the research is a focused look at Generation Z as the main consumption age group in the future. Understanding the behavior characteristics of this generation can help companies develop long-term strategic policies in terms of communication and configuration of value propositions. For example, research shows that social connections are highly valued by this generation, so a company can invest in creating a value proposition that enhances social value. Furthermore, the research indicates that since Gen Z is more innovative and tech-savvy by default, as they grew up and formed their consumer habits during the rapid development of innovative tech products and services. Then, the degree of relative innovativeness does not affect the perception of ecosystem value for them, unlike previous generations where the influence of innovativeness on value has been identified before. Additionally, the novelty value dimension of the Yandex ecosystem in this study contributed least to the overall value than other dimensions. From this perspective, Generation Z consumers are more demanding in terms of the innovativeness of services compared to other generations, which needs to be taken into account in service design and communications with such customers.

Additionally, the methods of enhancing synergy between services were also quantitatively validated. For example, previous research suggests the need to apply loyalty incentives in the form of cashback to increase loyalty and motivate users to use more services within the ecosystem. However, our research findings indicate that the value and intention to use new ecosystem services do not increase based on how positively and importantly Generation Z consumers evaluate cashback incentives. Therefore, when designing loyalty programs, decision-makers should take this into account and evaluate the perception of loyalty incentives from the standpoint of Generation Z customers in terms of loyalty, satisfaction, value, and intention to use services in the digital business ecosystem.

Meanwhile, we also tested how multi-service subscriptions such as Yandex.Plus affect value and intentions. On one hand, multi-service subscriptions impact the profits from individual services as they allow users to pay only for the subscription. On the other hand, such subscriptions increase the overall value of the ecosystem and result in greater customer involvement, raising switching costs and loyalty. Our findings suggest that for subscribed individuals, the effect of perceived value on the intention to use new services is significantly higher than for non-subscribed individuals. This provides decision-makers with a clear quantitative framework to evaluate the trade-off between lost profit compared to the case of separate services and the increase in overall service usage in the case of a multi-service subscription.

Overall, this presented research provides a validated framework for decision-makers in business ecosystems who are deciding on new partnerships, as well as for actors evaluating the number of ecosystems to join. The study takes a step towards evaluating new partnerships in a

business network not only from the demand-side, including knowledge access and access to new capabilities, but also from the value contribution perspective. Additionally, the more comprehensive view towards customer understanding is presented in according to which the company can construct its products and plan marketing communications. Based on the research findings, these managers can rely on a quantitative approach when performing strategic activities such as orchestration, change, and assembly in digital business ecosystems.

3.4.4 Limitations and future studies

Firstly, this research study applies an empirical quantitative method only to one ecosystem, as the diverse configuration and typology of services and needs covered by ecosystems do not allow for a direct comparison of ecosystem customers and their perception of value. Therefore, our findings serve more as a framework for decision-makers rather than a unified theoretical framework that can be generalized to all ecosystems. Therefore, future research should also apply the presented model to a larger number of ecosystems, reflecting their uniqueness and the needs they aim to address. Future research can make comparative studies by applying the presented model to new ecosystems.

The next limitation lies in the limited sample and convenience sampling technique, as well as the study being conducted only on Generation Z, as it was the initial scope of the presented paper. We also described that this generation possesses unique characteristics regarding information services, so their perception of value elements and individual innovativeness may differ from other generations. In the future, it is necessary to conduct research with a larger number of respondents from different age groups to compare the influence of innovativeness on values and intention.

One of the main limitations is the absence of an investigation into the individual contribution of services that respondents perceive as value elements to the overall perception of the integrated value proposition of ecosystems. Future studies can break down the overall value into the value of each individual element or add to the model a compounded measure weighted by usage frequency and satisfaction with individual services. Additionally, these studies can be supplemented with qualitative research using in-depth interviews to determine which specific elements of the ecosystem contribute to the formed dimensions of overall value.

Regarding methodological limitations, the maker variable was not included in the initial questionnaire design. Therefore, according to the mentioned study, we have limited power to assess Common Method Bias due to post-hoc analysis of CMV.

CONCLUSION

The modern business environment is rapidly evolving, leading to changes and transformations in many concepts that have been the status quo for decades. One of the new perspectives on structure and strategy is the business ecosystem. A business ecosystem is a system of interconnected participants and actors through a network structure, with the presence of complementors who come together to formulate a customer-facing value proposition. While the concept of a business ecosystem was introduced in 1991 by Moore, it has gained renewed attention with the development of digital ecosystems, which are particularly rapidly growing in the Russian business environment.

In the academic sphere, there is a growing body of research on this concept. However, many studies have pointed out the need for empirical validation of their findings, as the majority of research conducted so far has been conceptual. This raises an important question, especially in the context where the top 7 most valuable companies in the world are ecosystems. Moreover, only 10% of ecosystems are successful, while 90% of them fail or incur losses. Therefore, the need for empirical quantitative research has been identified.

A quantitative study on user preferences in the context of digital business ecosystems and Generation Z was conducted. The research aimed to identify the factors influencing the intention to use new services within a digital ecosystem through consumption value.

The first chapter focused on the research context, exploring the emergence and development of the theory of business ecosystems. Factors that distinguish business ecosystems from other strategic and structural concepts were examined, with a particular emphasis on the unique processes within an ecosystem, focusing on the concept of value creation and the formation of an integrated customer-facing value proposition. The chapter specifically addressed the one-sided product-based ecosystems, as this type of ecosystem is highly relevant in the Russian business environment and allows for a clear understanding of the influence of individual complementors on the integrated value perceived by customers.

The chapter then bridged the gap between value creation within an ecosystem and the perceived value by consumers. After considering other models explaining intention to use, the choice of the theory of consumption values was justified. In addition to the aforementioned theories, synergy creation tools in ecosystems, such as loyalty incentives in the form of cashback and multi-service subscriptions, were also examined. The chapter concluded by justifying the research focus on Generation Z and providing a thorough description of the unique characteristics

associated with this generation, such as innovativeness, as well as the related issue of digital addiction. Hypotheses for quantitative testing were formulated after introduction of each theory.

The second chapter focused on the methodological description of the study. The Yandex ecosystem was chosen as an example for the research since it is the most developed ecosystem that best fits the criteria outlined in the first chapter. Constructs were formulated, operationalized, and adapted to the context of business ecosystems and e-services. After a trial survey, which involved the composition, validation, and elimination of multivariate outliers, a convenience sample of 271 questionnaires was distributed among Generation Z.

The third chapter involved the exploratory and confirmatory validation of the measurement model and factors used in the proposed research model. A comparison between multidimensional and unidimensional models was conducted, resulting in the finding that the multidimensional second-order model better explains intention than the unidimensional model. Both models exhibited valid model fit, and an analysis of direct effects was conducted to test the relevant hypotheses. A multi-group analysis based on variables such as subscription to Yandex Plus, digital addiction, and loyalty incentives was also performed.

As a result of the third chapter, four hypotheses were confirmed, while four hypotheses were rejected. The final effects had a significant impact, and the model accounted for 55% of the explained variation in intention to use, considering value dimensions and product innovativeness in the IT domain. The results validated the application of Total Consumption Value (TCV) to the concept of digital business ecosystems, with social, usefulness, novelty and hedonic values proving to be valid and distinctive facets of consumption value. Additionally, controversial findings regarding Generation Z's innovativeness were brought to light, highlighting the need for future investigation.

The end of the third chapter consisted of a discussion of the theoretical and managerial contributions, as well as the formulation of prospects for future research. The results revealed a significant number of managerial implications, emphasizing the pressing need for more empirical and quantitative research targeting ecosystem customers.

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APPENDIX A

List of proposed and tested hypothesis

H1: The four constructs: UV, SV, HV and NV are distinctive facets of consumption value (CV);
H1a: Usefulness value (UV) is a distinctive measure of Consumption value (CV)
H1b: Hedonic value (HV) is a distinctive measure of Consumption value (CV)
H1c: Social value (SV) is a distinctive measure of Consumption value (CV)
H1e: Novelty value (NV) is a distinctive measure of Consumption value (CV)
H2: Second-order CV model has greater explanatory power of intention to use then first-order model.
H3: Consumption value (CV) positively influence the intention to use new services of Yandex ecosystem (IU).
H4: Product innovativeness in IT domain (PIIT) positively influence intention to use new services of Yandex ecosystem services (IU);
H5: Product innovativeness in IT domain (PIIT) positively influence consumption value of Yandex ecosystem services (CV)
H6: Consumption value (CV) mediates the effect of innovativeness on intention to use new services of Yandex ecosystem services (IU).
H7: Loyalty incentives moderate the effect of consumption value on intention to use new ecosystem services
H8: Subscription to Yandex Plus moderates the effect of consumption value on intention to use new ecosystem services.
H9: Digital addiction moderates the effect of consumption value on intention to use new ecosystem services.

APPENDIX B

Table for normality of variables

Table 1.

Descriptive and Normality statistics for measurement items

Construct	Name	Mean	Std. Deviation	Skewness	Kurtosis
Innovativeness in IT domain	PIIT1	3,21	1.07	-.30	-1.15
	PIIT2	3,07	.94	.22	-.43
	PIIT3	2,73	1.09	-.55	-1.13
	PIIT4	2,45	1.13	.52	-.81
	PIIT5	3,53	1.16	-.70	-.53
	PIIT6	2,98	1.27	-.01	-1.29
Loyalti inventives	LI1	3,14	1.32	-.14	-1.20
	LI2	3,64	1.19	-.67	-.43
	LI3	2,85	1.20	.05	-.69
	LI4	2,19	1.34	.54	-1.29
Digital addiction	DA1	4,12	.93	-.32	-1.32
	DA2	3,93	1.07	-1.1	-.73
	DA3	3,73	1.03	-1.23	-.43
	DA4	4,32	.98	-1.16	.21
Usefulness value	UV1	3,94	.98	-1.16	1.41
	UV2	3,88	.97	-1.19	1.41
	UV3	3,95	.97	-1.02	.91
	UV4	3,98	.90	-1.16	1.67
Social value	SV1	2,84	1.15	-.13	-.84
	SV2	3,47	.87	-.36	.89
	SV3	3,41	.94	-.41	.26
	SV4	4,09	.82	-1.15	1.96
Hedonic value	HV1	3,91	.95	-1.27	1.94
	HV2	3,85	1.07	-1.05	.63
	HV3	3,64	1.01	-.75	.15
	HV4	3,77	.97	-.79	.25
Novelty value	NV1	3,42	1.01	-.31	-.70
	NV2	3,31	.99	-.32	-.34
	NV3	3,44	.98	-.50	-.41
	NV4	3,34	1.02	-.30	-.30
	NV5	2,98	.95	.16	-.35
Intention to use	IU1	3,41	1.03	-.39	-.48
	IU2	2,72	1.03	.14	-.50
	IU4	3,04	1.06	-.16	-.83
	IU5	2,41	1.07	.31	-.68
	IU6	3,36	1.22	-.54	-.75
	IU8	3,46	1.20	-.73	-.36
	IU9	2,72	1.19	.00	-1.00
	IU10	2,58	1.17	.16	-.93
	IU11	3,11	1.34	-.34	-1.17
	IU12	2,73	1.23	-.02	-1.16

APPENDIX C

Measurement model assessed during CFA

Figure 1.

First-order measurement model

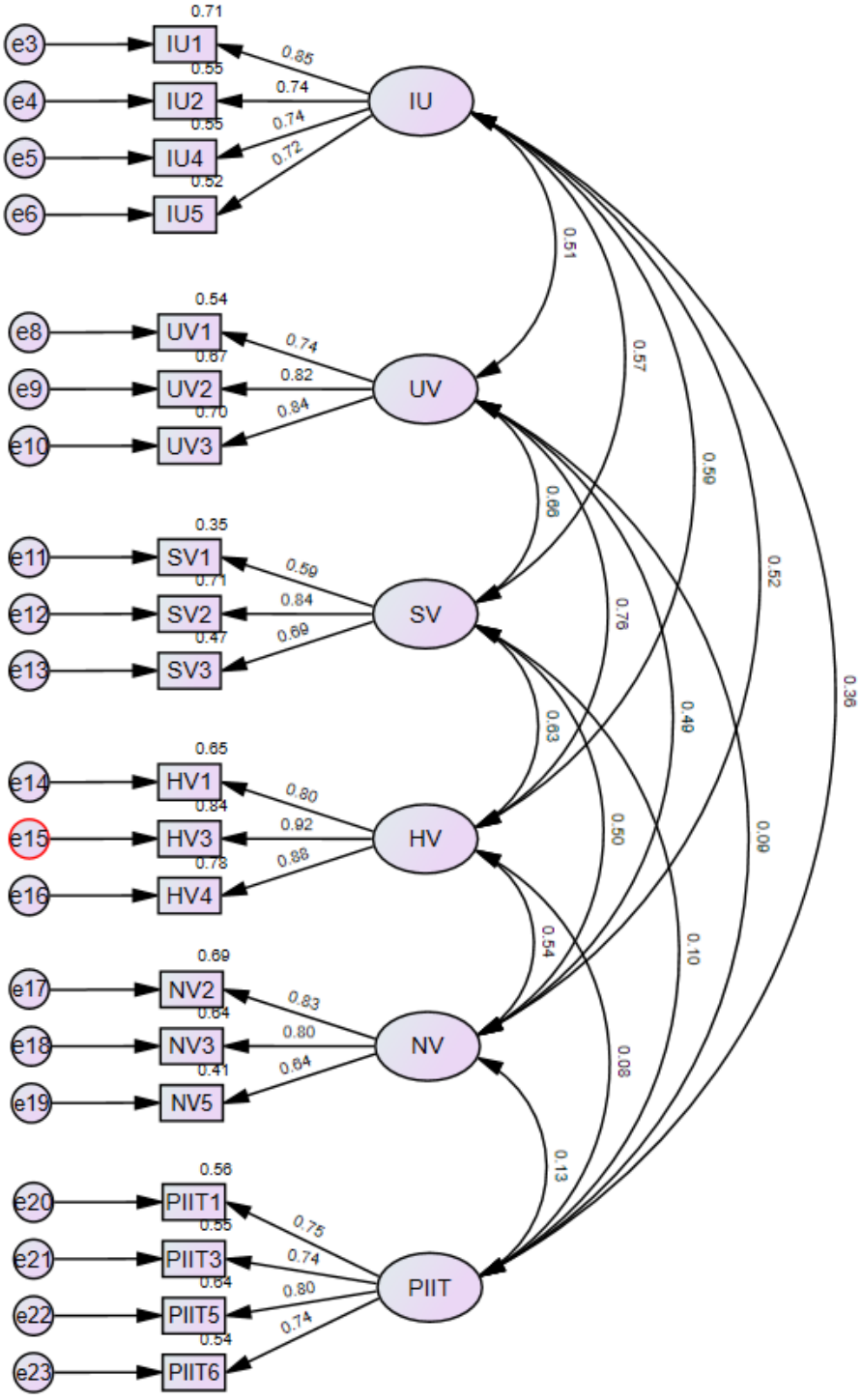
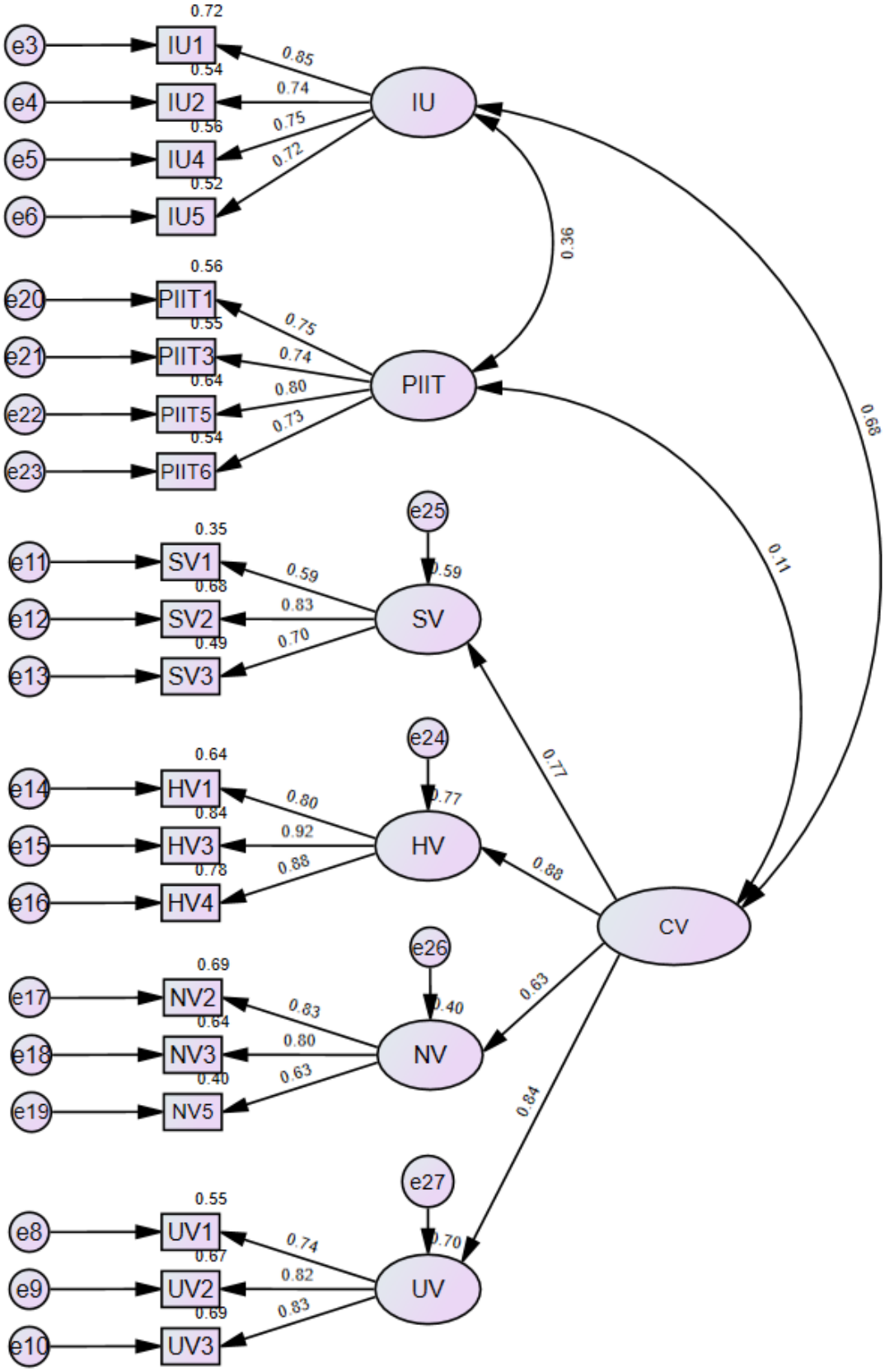


Figure 2.

Second-order measurement model



APPENDIX D

Survey items and design

Survey introduction

Perception Study of the Integrated Value Proposition of Ecosystems

Welcome!
Thank you for agreeing to take part in this research that is focused on respondents from 18 years to 26 years.
The purpose of the study is to test how the consumer perceives the services of the ecosystem and what factors influence the intention to use its IT services and products. Current research takes it for granted that the consumer perceives the products of an ecosystem as something cumulative. I want to test it and quantify it.
The survey has four sections, including demographics, and takes an average of 8 minutes to complete.
The survey can be completed without extensive experience in using Yandex.
Please note that providing sincere answers is critical to correct interpretation.
Thank you so much for your time!

* All responses are collected anonymously.
Please do not close the survey without completing it, the survey will be considered completed only after you click the Submit button.
Ecosystems are business organizations like Yandex, Sberbank. This is now a very popular trend for coordinating business units.
IT products and services - any electronic applications, services or goods.

Table 1.

Questions about usage

	I don't use it	I rarely use it	I use it often
How often do you use the following services:			
Cards			
Gas Station cards			
Parking lots			
Yandex. Drive			
Metro			
Traffic Jams			
Auto (on-board computer)			
Food			
Lavka			
Delivery in the city			
Scooters			
Taxi			
Search			
Mail			
Translator			

Yandex. Disk Translator			
Yandex. Weather			
Forms			
Calendar			
Notes			
Teleconference			
Yandex Browser			
Yandex Pay			
Music			
KinoPoisk			
Video			
Bookmate			
of the Game			
Workshop			
Yandex Tutorial			
Tutor			
Market			
Real Estate			
Auto.ru			
Ya.Services			
Hotels			
Sports			
TV Program			
Yandex. Afisha			
Q (questions)			
Railway tickets			
Air Tickets			
Buses			
Timetables			
Rent (letting out)			
Voice assistant Alice			
Zdorovye (telemedicine)			

Table 2.

Model factors survey questions

	Strongly agree → Strongly disagree				
Please rate you agreement with the statements from 1 to 5					
Usefulness Value of Yandex ecosystem adapted from (Omigie, 2017)					

UV1: Using Yandex ecosystem services helps me save time and effort					
UV2: Yandex ecosystem services meet my needs					
UV3: Yandex ecosystem services simplify my daily tasks and routines					
UV4: I believe that Yandex ecosystem services are practical and functional					
Hedonic Value of Yandex ecosystem adapted from (Ekawati, 2021)					
HV1: Yandex ecosystem services provide me with a pleasant experience					
HV2: I like the interface and design of Yandex ecosystem services					
HV3: Using Yandex ecosystem services gives me a sense of satisfaction					
HV4: In general, using Yandex ecosystem services brings me pleasure					
Social Value of Yandex ecosystem adapted from (Venkatesh, 2012)					
SV1: I think others most likely expect me to use Yandex ecosystem services					
SV2: I think that my friends rather approve of my use of Yandex ecosystem services					
SV3: I think that people whose opinion is important to me use Yandex ecosystem services					
SV4: I think Yandex ecosystem services are popular among my peers					
Novelty Value of Yandex ecosystem adapted from (Truong, 2013)					
NV1: It seems to me that Yandex ecosystem services offer innovative and unique opportunities					
NV2: I believe that Yandex ecosystem services are more advanced than their competitors					

NV3: I believe that Yandex ecosystem services stand out from other similar services					
NV4: I believe that the Yandex ecosystem is constantly introducing new and revolutionary services					
NV5: I think that Yandex ecosystem services are ahead of the innovation trends in the industry					
Intention to use new services within Yandex ecosystem adapted from (Hanafizadeh, 2012; Goh, 2014)					
IU1: I will try to use new Yandex services as they are released					
IU2: In the next 3 months, I will most likely try a new Yandex ecosystem service for me					
IU3: I plan to continue using Yandex ecosystem services in the future					
IU4: I will actively explore new features and services introduced by the Yandex ecosystem					
Intention to use new services within Yandex ecosystem as authors suggestion					
IU5: I intend to use the new financial services of the Yandex ecosystem					
IU6: I intend to use the new Yandex ecosystem delivery services					
IU7: I intend to use the new educational services of the Yandex ecosystem					
IU8: I intend to use the new Yandex ecosystem travel services					
IU9: I intend to use the new social services of the Yandex ecosystem					
IU10: I intend to use the new business services of the Yandex ecosystem					
IU11: I intend to use the new Yandex ecosystem search services					
IU12: I intend to use the new personal organization services of the Yandex ecosystem					
Product innovativeness in IT domain adapted from (Hartman, 2004)					

PIIT1: I often start discussions about using new IT products or services with other people.					
PIIT2: I am interested in exploring the possibilities of new IT products and services					
PIIT3: I am actively looking for information about new IT products and services					
PIIT4: I am more interested in new IT products and services than my friends					
PIIT5: I keep myself up to date with the latest trends in technology and services					
PIIT6: I am always eager to try new IT products and services					
Perception of Loyalty Incentives within Yandex ecosystem (Naidoo, 2007)					
LI1: The Yandex ecosystem offers many incentives to use its services					
LI2: I like to take advantage of the I+ cashback program.					
LI3: I receive appropriate reward for using Yandex services					
LI4: I would be disappointed if I could no longer use the I+ cashback program					
Digital addiction to IT services and products adapted from (Pawlikowski, 2013)					
DA1: I often feel depressed, pessimistic, and angry when cannot use IT services?					
DA2: I am highly dependent on the use of IT products and services					
DA3: I can't imagine being without IT products and services in my daily life					
DA4: The option to live without IT services and products makes me nervous					

State your age*:

- 18 and younger
- 18-26
- 27-36

- 37-47
- 48-57
- 58 and older

*survey led to closing page if the age was not satisfactory for generation Z.

State your gender:

- Male
- Female

Highest level of finished education

- Unfinished middle
- Middle
- Middle special
- Unfinished Higher degree
- Higher degree

Are you subscribed to Yandex Plus?

- Yes
- No

APPENDIX E

Subject index

List of tables

List of figures

List of abbreviations

TCV: Theory of Consumption Values
TAM: Technology Acceptance Model
UTAUT: Unified Theory of Acceptance and Use of Technology
PERVAL: Perceived Value Model
SERVPERVAL: Perceived Value of a Service Model
GLOVAL: Global Value model
TCV: Theory of Consumption Values
TAM: Technology Acceptance Model

UTAUT: Unified Theory of Acceptance and Use of Technology
PERVAL: Perceived Value Model
SERVPERVAL: Perceived Value of a Service Model
GLOVAL: Global Value model
CV: Consumption value
UV: Usefulness Value of Yandex ecosystem
HV: Hedonic Value of Yandex ecosystem
SV: Social Value of Yandex ecosystem
NV: Novelty Value of Yandex ecosystem
SEM: Structural Equation Modelling
TRA: Theory of Reasoned Action
CFA: Confirmatory Factor Analysis
EFA: Exploratory Factor Analysis
RMSEA: Root Mean Square Error of Approximation
GFI: Goodness-of-fit Index
CFI: Comparative Fit Index
TLI: Tucker-Lewis Index
IU: Intention to Use
PIIT: Product Innovativeness IT domain
NV: Perceived Novelty Value
SV: Perceived Social Value
HV: Perceived Hedonic Value
ML: Maximum Likelihood
KMO: Kaiser-Meyer-Olkin
SPSS: Statistical Package for the Social Sciences
VIF: Variance Inflation Factor
SEM: Structural Equation Modelling
BRUSO: Brief, Relevant, Unambiguous, Specific, Objective
VK: VKontakte
IT: Information Technology
IU: Intention to Use
Gen Z: Generation Z