KEY ASPECTS OF THE DIGITAL BUSINESS MODEL DESIGN

The key elements of the company’s digital business model in the modern competitive market environment are substantiated and its key elements are revealed. The scope of the company’s digital focus in the online space is interpreted and the essence of the digital-value-drivers matrix concept for digital business model design is disclosed. The transitivity of the digital business model that contributes to the enterprise sustainable development in the market is justified.

Key words: information technology, digital business model, digital technologies, digital key elements, digital focus areas.

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Introduction. In a highly competitive environment, enterprises need a permanent introduction of innovations to ensure long-term sustainable market advantages, as well as to promote their effective persistent functioning. The implementation of the digital business model is one of the perspective areas, which makes it possible to realize the enterprises activities more productively. The digital business model allows enterprises to respond more sensitively to the needs of potential buyers and customers, and also adapt and optimize the enterprises activities over a specific period of time in the market.


Therefore, the purposes of the article are to define the information technology impact nature on the transformation of enterprises digital business model; to determine features of developing enterprise digital business model; to substantiate the importance of studying the dependence of digital key elements and digital focus areas, which is the basis for identification the digital-value-drivers matrix concept.

Key research findings. The role of information technology (IT) and its relationship to the business has shifted over the last years. Companies have progressively transitioned from a focus on the design of information systems, to the design of IT-enabled business processes, and more recently to the design of business models for services provided through digital platforms. While this attention to business models for digital platforms initially started in the networked digital industry it is increasingly being propagated to all industries whether healthcare, energy, retail, or financial services. As more customers consume products and services offered through
digital platforms, the managerial stakes in understanding those models is becoming much higher, especially when these products and services have to be offered to and priced for consumers.

If there is something that defines the digital economy – its need to seek out new business models and to combine them in a way that best meets companies’ intended goals. Since most of these new business models are blended, which is to say combinations of several business models, it is difficult to classify them as belonging to one specific category or another [1].

A business model defines how a business makes profit. A digital business model is therefore a recasting of the question in terms of what it takes to do this digitally. But it would be a mistake to just think of traditional business models as needing just a tweak to make them “digital” [2]. The new digital economy is based on this idea of blended business models, on the absence of a single fixed model. Therefore, it is important to remain open to the possibilities that blended business models offer and not to confuse them with the more inflexible models often associated with the analog or physical world. It must be understood that, when adapting business models to the digital area, these models will all either evolve or merge with other models [1].

Understanding digital business models is vital to the survival of all companies [3]. Learn how to create a digital business model for sustainability and growth will help companies to create business value with digital processes and the power of an extended.

The term e-business as equal to digital business generally which refers to “doing business electronically” and includes e-commerce, e-markets, Internet-based business and any firms that carry out commercial transactions over the Internet (Zott et al, 2011). Many authors also developed business model ontologies in order to conceptualize the relationship of different components of a digital business model. Gordijn and Akkermans (2001) presented a conceptual modeling approach to digital business, which is designed to “help define how economic value is created and exchanged within a network of actors”. The ontology uses concepts derived from various economic and business science literature to form a conceptual tool to analyze digital business projects. However the most cited study was Osterwalder (2004)’s business model ontology, which provided a clear and comprehensive framework to analyze generic business models. Many studies have used the Osterwalder’s ontology to analyze and explore various business models in different industries. For example, Tankhiwale (2009) has applied the ontology to analyze the business model interrelationship with the change in business process architecture of a big telecommunications service provider. Osterwalder (2004)’s ontology addressed four areas of a business, which are product, customer interface, infrastructure management and financial aspects.

A large amount of literature on digital business models focused on the components of a digital business and strategic marketing in digital businesses. Weill and Vitale (2001) developed an atomic e-business model schematic to help analyzing a digital business initiative by highlighting its important elements. The schematic illustrates the relationships and flows of money, products or services, and information between the involved participants, including the firm of interest, customers and suppliers and allies. Applegate (2001) used a simple framework to analyze digital business models, which comprised a business concept, the company’s capabilities and value delivered to all involved stakeholders [4].

Today’s companies have a variety of IT solutions at their disposal to simultaneously increase operational efficiency and generate unprecedented business capabilities. Unfortunately, many do not use these tools to their full potential, often as a result of not knowing what these solutions entail or because of the sheer volume of data and complexity of analysis that renders decision-making a challenge. In this case, these companies miss the most profitable business opportunities [5].
Companies today increasingly realize they can no longer focus on just selling products; they need to sell an experience. An increasing number of products today both consume and generate data, and many are interconnected through the Web. Because of this increased intelligence, their usage can be monitored, additional services can be proactively offered, or maintenance can be provided when a problem is detected [6].

Business and IT lack a common language that allows us to consistently discuss, analyze, and design opportunities that take advantage of the digital transformation. This hampers the systematic approach toward digital innovation, and it is necessary to consider this as one of the most important obstacles for implementing a digital strategy. On the business side, companies can start from the business model canvas as an established approach to model the way a company creates, delivers, and captures value. On the IT side, companies need a similar minimalistic and semantically approach to investigate and describe capabilities [7-8].

As a synthesis of different views that IT analysts and practitioners are commonly using it is necessary to analyze and create digital capabilities through object-oriented and functional representation based on five key elements – digital key elements: people, businesses, things, data, and cloud (Figure 1).

These digital key elements do not regard digital capabilities from a mere technology perspective but, first of all, take a business perspective [10]:

1. People of the digital age are informed and knowledgeable; they are the source and the foundation of the digital economy. In digital business model, the term “people” is used as an abbreviation for digitally connected individuals and communities who leave their data in the digital world. People use digital capabilities via different types of devices (desktops, laptops, tablets, smartphones, wearable devices like smart watches and e-lasses, and so on), experiencing various kinds of human-computer interactions. That is why, the mobility is a key access point to digital capabilities. Through the same devices, people digitally connect to other people. Now online communities and social networks are digitally enabled network-based relationships of individuals. Digital social business is value creation from human-to-human digital connections.

2. Businesses in the past were self-optimizing entities in a static environment, but nowadays they are compelled to continually evolve their dynamics to regularly self-disrupt and renew themselves in a constantly changing environment. This particularly concerns the
networks in which they work together with other companies to generate value. Due to digital technologies, the dynamics of these networks have visibly increased. In digital business model, the term “businesses” is used as an abbreviation for digitally connected businesses or groups of businesses that combine their digital capabilities to create new solutions. Businesses digitally connect to other businesses, to individuals, and to assets, with different types of digital means – for example, the public Web, XML standards, and connectors to marketplaces.

Things nowadays increasingly becoming part of the digital world, interacting smartly with people, businesses, or other objects. In digital business model, the term “things” is used as an abbreviation for digitally connected objects, or smart things. Smart things are typically equipped with sensors that produce data and might even have their own application logic. They also exchange data and might connect to networks. Smart things can automatically react to contexts without customer interaction. This can include customers’ smartphones insofar as they serve as smart sensors (for example, for the customer’s current location). In addition, it necessary to consider any technologies for digital manufacturing (for example, 3D printing) that use digital information to produce physical objects as being part of this category. The Internet of Things enables individual physical objects to connect to and interact with other objects, people, and businesses – creating value from information exchanges. In particular, machine-to-machine interactions is regarded as value creation from things-to-things digital connections.

3. Data, from a technology perspective, deals with records in databases and data management processes. It is suggested looking at data as a business asset that can be leveraged for new digital business models. In digital business model, the term “data” is used as an abbreviation for real-time, complete, detailed, consistent, transparent, and accessible information and any algorithms employing this data for analysis, planning, and prediction – including cognitive computing. This includes sophisticated analytics procedures that process small or large amounts of data and generate consumable information. Therefore, Big Data and smart data is considered as part included in the “data” category.

4. Cloud, from a technology perspective, is just an infrastructure, but it is suggested looking at cloud as a value-creating service type with specific characteristics:
   - a service that handles abstract resources (digital contents or information associated to a physical resource or product or a natively digital product);
   - a service that is on demand (available per request);
   - a service that is scalable (depending on the demand);
   - a service that you can pay per use (can pay based on consumption);
   - a ubiquitous service (accessible from anywhere).

In this way, the cloud becomes a service model and a logical shared environment in which people, businesses, and things connect in order to exchange and accumulate data as well as to offer and consume digital services.

In practice it is important mainly look at the strategic business value and impact of digitalization through the business model canvas. In this aspect, it is defined digital focus areas as the areas of relevant transformational potential of digital technologies for each component of the digital business model canvas. It is important to note that the epicenter of the digital paradigm shift concerns the actual interaction of the company and the customer – that is, the value proposition and the customer-relationship components. However, the seismic waves of these epicenters go through the entire digital business model. In this section, it is described digital focus areas by highlighting the value and impact of digital technologies per business model component, starting from the epicenter and advancing to the periphery of the business model. The digital transformation generally affects all parts of a digital business model.
Before describing the individual focus areas in more detail, it is explained how the effects of the paradigm shift go through the entire digital business model [11]:

1. Customer relationship. This is one of the two epicentral components in the digital business model from which company can start a revision. The central goal is to extend and intensify the relationship by digital means and place more emphasis on this element. Relationships with customers have gained importance because value co-creation between the company and its customers has become a central element of innovation [12].

2. Value proposition and customer segments. The value proposition is the second epicentral component and closely related to customer relationships. The boundary between customer relationships and value proposition becomes blurry due to the growing importance of value co-creation. Customer segments mainly adapt to these changes.

3. Channels. The base for an extended and intensified customer relationship usually requires the use of new digital channels to reach global markets and foster relationships with customers.

4. Key activities. The changed interaction, the new value proposition, and the use of digital channels require new activities – for example, in terms of channel and community management or new kinds of analytics to enhance the value proposition.

5. Key resources and partners. New key activities are often based on new resources such as data or analytic algorithms or may require new partners from which they can be obtained.

6. Revenue and pricing. In various cases the new interaction also requires a new pricing schema – for example, adaptive pricing. The latter is also a means to keep customers in the interaction when they try to find the optimal point for a purchase.

7. Cost structure. Digital technologies often lead to cost optimization, such as zero marginal costs of digital contents, reductions due to increased transparency, the ability to predict costs, and various network effects.

This is only a rough guideline, and the effects on the digital business model elements are more complex and include more aspects.

A. Outcome-driven value proposition

Companies can usually distinguish a physical part and an informational part, which can include the descriptions (for example, product details, usage manuals, instructions, monitoring data, and a control interface. Media-related products can be completely digitalized (dematerialization). The more the physical part of products has to be monitored and controlled, the more digital technologies come to the fore.

The ability of digital technologies to support the informational part of products and the related information flow raises the potential to transform a product into a service (XaaS), a model in which the ownership of the physical part of products is not mandatory and the usage of the product is facilitated by digital technologies. For example, the ability to book, locate, and access a car (a product) via a smartphone enables cars to be made available as resources for urban car sharing (a service).

Digital technologies extend their impact on the end-to-end customer journey. The ability to collect and process information in real time as well as to a high level of detail gives companies the possibility to provide customers with precisely what they need and when they need it. In contrast to static products, digital services are adaptable to the specific situation (in real time). Services require less knowledge transfer, because the service provider mainly handles adaptation to specific circumstances. For example, the ability to connect data about location, weather conditions, and preferences of a driver enables the possibility to propose specific and appropriate offerings when a car approaches a gas station.
B. The growing role of value co-creation also increases the importance of value delivery:
   - customer relationships: disintermediation, perpetuation.

   Product business goes hand in hand with a focus on the act of purchase, whereas service business rather fosters a long-term engagement. Moreover, value propositions become more complex due to value co-creation: they are no longer static promises of fulfillment regarding the job-to-be-done but consist of an interactive collaboration between digital service provider and customer; value co-creation further perpetuates customer relationships, which might gain a more important role than the value proposition.

   The fact that digital interaction can often be realized directly further intensifies this – that is, without intermediation of a partner, because companies can easily establish digital services and interaction with their customers and partners.
   - channels: global reach and omnipresent information exchange.

   Companies can expose, communicate, and deliver their value propositions regardless of customer locations and time of day. Integration capabilities (with mobile access) allow companies to establish channels to customers at any time and place. These channels are maintained over a longer period of time as a precondition for intensified customer relationships. Typical examples are the various customer forums that companies have established to support customers in providing mutual aid, often in a better way than the company could itself provide it. Such forums also give potential customers information about the qualities of the solution and help them in making purchase decisions.
   - customer segments: individualization.

   The ability to collect and process a multitude of data around customers allows companies to offer personalized solutions and experiences and to create segments of one. Even if it does not go to this “one customer – one segment” extreme, generally, it is said that customer segments become more finely granular.

C. Value creation.
   - key resources: access, virtualization, extension of resources.

   Access to networks of digitally connected people, businesses, and things as well as data processing capabilities represent new resources.

   Digital technologies facilitate discovering, getting, and managing different types of resources (materials, information, assets, intellectual property, financials, skills), even without owning them directly, but by mastering the information flow associated to resource planning, coordination, and management. Through digital technologies, hybrid pools of owned and outsourced resources can be handled virtually as own resources (virtualization).

   Thus, companies can significantly extend the set of resources that can be leveraged in their digital business models.
   - key partnerships: digital resource providers.

   Digital technologies open up opportunities for providers of new digital resources. This may also affect established companies that already possess digital resources but now decide to offer them to other parties. For example, computing centers can be offered for cloud services and the access to smart items can be offered to third parties that are interested in providing their own services via this channel.
   - key activities: information excellence, network management.

   Due to the increasing importance of information management for modern companies, companies need excellent capabilities (skills, processes, methods, tools) to manage information adequately in their competitive landscape. This enables knowledge workers to make informed decisions that are based on the insights coming from software intelligence arranged by data scientists.
Parallel to the growing importance of data and its management is the increasing significance of networks. These networks of either people or businesses have to be managed actively to attract and keep participants. Therefore, the management of these networks has become an important area of activity in a company.

D. Value co-creation.

Value co-creation points to the fact that customers do not consume value (provided as products or services) but are actively involved in the interaction that generates value and even returns value to the supplier, which goes beyond mere monetary compensation. In the course of digitalization, this interaction has often become so intensive that the roles of service providers and service consumers cannot be clearly distinguished anymore. For example, digital technologies allow creating platforms that establish a transparent marketplace populated by various types of business partners, such as service providers and parties interested in these services. Such a setting attracts users, initiates new solutions, and establishes a business environment. The entire constellation is generally self-reinforcing. For example, a growing group of potential customers makes a platform more attractive for service providers, while a larger and more transparent selection of service providers increases the interest of potential customers of such services. In this way, platforms provide a powerful realization of digital business.

Referring to the digital business model canvas, the players involved in value co-creation cannot be clearly classified as partners or as customers and actually belong to both categories: on the one hand, they take part in value generation and make resources available as, for example, data; on the other hand, they have to be attracted and require a value proposition. Therefore, we have decided to introduce a focus area that spans both components.

E. Value capture.

- cost structure: cost optimization.

Digital technologies enable cost optimization opportunities. Transparency on business process performance enables a more accurate cost control – the ability to analyze any aspect of business in real time enables more accurate planning, more timely reactions to unplanned events, and the ability to anticipate those events based on predictive models. Zero marginal costs of digital contents can significantly change the cost structure compared to the equivalent physical, information intensive product (think of the cost to produce a new copy of an e-book compared to the cost of producing a new copy of a hardcover book). Digital technologies enable network effects that drive economies of scale with a potential impact on the company’s cost structure.

- revenue streams: new revenue streams and pricing models.

Digital technologies enable new types of revenue streams. On the one hand, we find direct revenue streams as, for example, by the monetization of data or by making solutions consumable (for example, improving the customer experience). On the other hand, there are also indirect effects that lead to new revenue streams. For example, digital technologies lead to a reduction of transaction and coordination costs that makes services economical that were not profitable before. Data collected around the customer enables new types of pricing models that are highly tailored and dynamically adapted based on the customer profile and context.

Figure 2 graphically demonstrates the digital focus areas associated with components of the digital business model canvas.
In the context of digital business model creation, it is important to understand how digital capabilities generate value. In this context, digital value drivers must be considered. This means specific value-generating effects that come along with digital key elements in a business context. Moreover, it is possible to associate value drivers with certain components of the digital business model canvas and, as a result, create a matrix that has components of the digital business model canvas as one dimension and the digital key elements as the other dimension while digital value drivers appear in the matrix elements (Figure 3).

For each digital value driver, company needs to provide key questions that can use as a basis for collaborative sessions for designing digital and digitally enabled digital business models.

However, successful digital business models are only transient. Incumbents need to constantly revisit their digital business model to ensure it is not outdated. There are five practical steps that companies can follow to rethink their business model [14].

**Figure 2 – Digital focus areas [10-13]**

1a – Digital resource providers; 2a – Information excellence, network management; 3a – Access, virtualization, extension of resources; 1b – Partner side; 2b – Customer side; 1c – Outcome-driven value proposition; 1d – Disintermediation, perpetuation; 2d – Individualization; 3d – Global reach, omnipresent information exchange; 1e – Cost optimization; 2e – New revenue streams and pricing models.
Assess current digital business model. Companies should begin with a thorough understanding of their current digital business model. Emergence of new competition from unexpected places is a sign that companies need to start looking at their business model. Constant reinvention of the business model holds the key to continued relevance in the digital world order.

Spot potential disruptions. Companies should constantly monitor signs that might indicate potential threats or opportunities.

Define nature of response. Companies can choose to operate defensively or offensively. When in defensive mode, companies often use data and any other advantage they can muster to slow the decline of the old model. In addition, aggressive operational cost cutting can release cash and investment capacity to support the transition. Companies can also choose to be aggressive and be a first mover in rethinking the digital business model of their activity. They can try to disrupt competitors, or other industries, by substituting a traditional product or service with a new digital offering or use any of the other approaches we have outlined in the earlier part of the paper to innovate their business model.

Focus on the value delivery. Each approach to digital business model innovation will open up several possible avenues. Companies will need to prioritize options that generate the greatest value to customers, that are operationally hard to copy, and that can provide them with a profitable economic model. Companies will also have to lower their risk by running controlled experiments on their new model.

Implement from the top. Designing, experimenting, and implementing new business models is a task for senior business leaders. It is a strategic activity. Functional heads will not have sufficient authority to drive new business model experimentation across business silos. The implementation of a new model requires vision, leadership, and governance. If the new digital model is ultimately designed to replace the old, companies need to know when to shift resources and at what rate. The transition will not happen overnight. If the old and the new are designed to coexist, they will need to carefully manage potential conflicts and resource allocation between the two. The digital business model innovation needs to become a core capability for companies, with knowledge, best practice, and the right talent. Incumbents need to be the agents of their own destiny – shifting their business models to secure their continued relevance in a new digital world order.

Therefore, companies need to use a continuous evaluation approach in order to devise a successful digital business model design.
Conclusions. It is determined that the emergence of the digital economy has unlocked new opportunities, leading to the creation of innovations in data driven industries. New digital business models have disrupted the existing business models of established industries. While the digital economy initially stemmed from the technology sector, digital business models have begun to permeate large and small companies in a variety of sectors. The features of the development of the digital business model including the identification of the main digital elements are studied. The digital focus areas are visualized, and the digital-value-drivers matrix concept, which contributes to the effective operation of the enterprise in the digital environment, is presented. It is determined that the digital business model should be transient to ensure the sustainable development of the enterprise in the market.

The aim of the article is to define the information technology impact nature on the transformation of enterprises the digital business model; to determine features of developing enterprise digital business model; to substantiate the importance of studying the dependence of digital key elements and digital focus areas, which is the basis for identification the digital-value-drivers matrix concept.

The results of the analysis. It is determined that the emergence of the digital economy has unlocked new opportunities, leading to the creation of innovations in data driven industries. New digital business models have disrupted the existing business models of established industries. While the digital economy initially stemmed from the technology sector, digital business models have begun to permeate large and small companies in a variety of sectors. The features of the development of the digital business model including the identification of the main digital elements (people, businesses, things, data, and cloud) are studied. It is explained how the effects of the paradigm shift go through the entire digital business model.

The digital focus areas are described. In addition, it is graphically demonstrated the digital focus areas, which associated with components of the digital business model canvas. It is justified that in the context of digital business model design, it is important to understand how digital capabilities have specific value-generating effects that come along with digital key elements in a business context.

The digital-value-drivers matrix concept, which contributes to the effective operation of the enterprise in the digital environment, is presented and visualized. In this way, value drivers associate with certain components of the digital business model canvas and, as a result, in the article it is presented a matrix that has components of the digital business model canvas as one dimension and the digital key elements as the other dimension while digital value drivers appear in the matrix elements.

It is determined that the digital business model should be transient to ensure the sustainable development of the enterprise in the market. It is explained that the transition of the digital business model will not happen overnight. If the old and the new are designed to coexist, they will need to carefully manage potential conflicts and resource allocation between the two.

Conclusions and direction for further research. It is determined that the digital business model needs to become a core capability for companies, with knowledge and the best practice. The five practical steps that companies can follow to rethink their digital business model are investigated. It is justified that companies need to use a continuous evaluation approach in order to devise a successful digital business model design.

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Ключові аспекти проектування цифрової бізнес-моделі
Обґрунтовано визначальну роль цифрової бізнес-моделі підприємства у сучасному конкурентному ринковому середовищі та виявлено її ключові елементи. Інтерпретовано сфери цифрового фокусування підприємства в онлайн-просторі та розкрито сутність концепції цифрових ціннісних значень драйверів при розробці цифрової бізнес-моделі. Обґрунтовано транзитивність цифрової бізнес-моделі, що сприяє сталому розвитку підприємства на ринку.

Ключові слова: інформаційні технології, цифрова бізнес-модель, цифрові технології, ключові цифрові елементи, сфери цифрового фокусування.

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