

Digital Transformation: The Impact on Corporate Strategy

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Abstract

The article focuses on adapting a company's strategy to the conditions of digital transformation. Digital transformation is a process of adopting a new mindset and a company's culture for implementing the newest digitized technology advancements. The paper examines the impact of these processes in the business by using Kaplan and Norton's model of strategy maps. The aim is to create higher value for customers, invent information-based products and services, optimize operational processes, use efficiently the resources, increase digital literacy and relations between employees and develop a sustainable business model that establishes competitive advantage. A typology of digital business strategies is proposed in terms of two dimensions: adoption of products (services) that incorporate modern digital technologies and creation (implementation) of consistent strategy to achieve digital transformation.

Keywords: Digital transformation, company's strategy

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1. INTRODUCTION

A systematic approach to science imposes a paradigm. Most of the

output we observe is influenced not by the productivity of individual elements but by the effectiveness of the links between them. Neurobiologists have observed that the human brain contains 100 billion neurons that bind to each other and transmit signals through over 1,000 trillion synaptic connections. This information flow determines the thinking, memory, behavior, capacity for movement of individuals.

Digital and mobile devices are changing living conditions, notably by increasing the number of connections between individuals, between them and the material world, between devices used in production processes and daily consumption, in the storage, retrieval, processing, and use of information. This raises productivity and efficiency in all spheres of life, in the way people contact and reproduce, explore the world around them, develop science, interact with nature, and organize production and service spheres. Big data represent the flow of information similar to that of a human brain with as many or even more artificial synaptic connections. However, this change requires adaptation and is a new step in the development of Homo sapiens.

What we observe in reality is that there are substantial gaps between the development of technology, the willingness and ability of people to adapt to them versus the readiness

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of companies and public institutions to meet the expectations. Individuals as consumers require a higher speed in adopting digitalized products and channels to exchange information. Companies are lagging behind this trend and sometimes are even reluctant to switch their business model. Public organizations are even slower in acknowledging the tide of the new informational, digital era.

This article focuses on adapting a company's strategy to the conditions of digital transformation. The first part is devoted to the definition of digital transformations in economics and the driving forces that stimulate the acceleration of their application. The second presents the impact of these processes in the business by using Kaplan and Norton's model of strategy maps. The third proposes a typology of digital business strategies in terms of two dimensions: adoption of products (services) that incorporate modern digital technologies and creation (implementation) of consistent strategy to achieve digital transformation. The conclusion summarizes the reflections on the subject.

2. DEFINING DIGITAL TRANSFORMATION IN BUSINESS

There is no uniform definition of digital transformations in scientific journals. Scientists and companies focus on different components. Three different terms are often met in the literature and sometimes they are used interchangeably: digitization, digitalization, and digital transformation.

In this article, the concept is adopted that the three are different stages in the process of application of digital technologies as they are defined by Bharadwaj et al. as a "combination of information, computing, communication, and technologies" (Bharadwaj, et al., 2013).

Genkova coins shorter-term "connectivity products" (Genkova, 2021).

Digitization is at the operational level. It is defined as "the technical process of converting analog signals into a digital form" (Legner, et al., 2017) or in more detail "taking analog information and encoding it into zeros and ones so that the computer can store, process, and transmit information" (Bloomberg, 2018).

Digitalization is a tactical application. Gartner Inc. in its IT glossary considers a wider scope: "Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business." (Gartner, 2021).

Digital transformation is a strategic shift. It reflects "the ability of organizations, its leaders and employees, to adapt to rapid changes wrought by evolving digital technologies" (Kane, 2019). Fitzgerald et al. define digital transformation as "the use of new digital technologies (social media, mobile, analytics or embedded devices) to enable major business improvements (such as enhancing customer experience streamlining operations or creating new business models)" (Fitzgerald, et al., 2013).

A thorough discussion about conceptual, semantic, and pragmatic approaches to the definition of digital transformation is provided by Gong & Ribiere. They define "digital transformation as a fundamental change process enabled by the innovative use of digital technologies accompanied by the strategic leverage of key resources and capabilities, aiming to radically improve an entity and redefine its value propositions for its stakeholders" (Gong & Ribiere, 2021).

Digital transformation affects various aspects of company operations. The impact on the competitiveness of firms is

discussed in detail by Bankova. “Responsible competitiveness requires continuous innovation and collaboration to break free from outdated business models and management approaches and create a new generation of sustainable economies” (Bankova, 2017). Marinov conducts an empirical study on innovation in Bulgarian firms. He confirms that “technological synergy is a success factor for new products” (Marinov, 2020). Netseva-Porcheva examines the hypothesis of whether firms adopting a value-based pricing strategy realize higher results than firms adopting a cost-based or competitive pricing strategy. The empirical evidence is mixed (Netseva-Porcheva & Bozev, 2020). Ivanov discusses renewable energy technologies (Ivanov, 2019).

In many cases, companies perceive digital transformation either just as drastic changes in technology or a substantial increase in the exchange of information. That is why very often the process is defined in negative terms. In addition, misleading perception is as harmful in defining transformations in strategy as sticking to an already implemented one. What does digital transformation consist of but is not if a researcher or a leader applies a holistic approach? Here is a shortlist.

- Installing new hardware. Most of the leaders in the modern world are aware of Moore’s law that the number of transistors on integrated circuits doubles approximately every two years. It allows the increase in processing speed and influences the prices of electronic devices. Companies can collect, access, process information faster. However, even the most modern computer will be useless if its power is not harnessed to solve a specific problem. Moreover, customers’ preferences, hyper-competition, regulatory restrictions influence the set of decisions that should be solved.
- Applying the modern software: CRM (customer-related management), ERP (enterprise resource planning), HRM (human resource management), QM (quality management), accounting, financial, and e-commerce products. There is a pick for everybody. Every one of them allows leaders to manage the single process more efficiently, but they are just building blocks and if not arranged properly will not create a sustainable business solution.
- Going to the cloud. Transferring information at high speed in different regions of the planet is crucial for modern global and multinational corporations. Coordination between subsidiaries depends on this flow of data. Increasing the scope and velocity of exchanged information will support and not guarantee the relevance and adequacy of the selected business model. True innovation comes from how these data are interpreted and used to make strategic decisions.
- Creating networks. The key shift for businesses is that value creation is delinked from asset ownership. Ownership is replaced by access rights. New platforms connect customers with providers of services instead of providers of goods. One does not need to buy a player or a disk to watch a movie on a streamlined channel. “Sharing” or “on-demand” economy is proliferating. At the same time, companies strengthen the links with their customers and providers because value creation becomes an interactive process. Managing a network

is a paradigm shift from managing a single enterprise no matter how big it is.

- Establishing e-channels to connect with customers. Traditional demographic metrics (as age, sex, income, level of education, religion) are replaced by sophisticated observation of human behavior, by research on individuals' ideas, interests, preferences, supported causes in social networks. Big data allows better segmentation, providing tailored products and services but also raises annoyance and resistance to intrusion in individuals' lives.
- Going mobile. The anecdote that very soon a surgical operation will be needed to separate a smartphone from the palm of a human being has already grown a long beard. A lot of business transactions are fulfilled online. Business intelligence becomes more and more sophisticated using the location of the customer to push notifications about specific activities and products that could be found nearby. Mobile devices keep employees connected, improve productivity. They have more and even more, sensors installed and the question is how to incorporate this data into the company's activities?

Every one of these approaches perceives digital transformation from a different perspective that reflects the specifics of the company. One will be the attitude to digitize the business for a small company and different for a multinational corporation with a lot of subsidiaries. Moreover, they will and have to devote a contrasting amount of investment to achieve substantial results. Usually thinking about digital transformation people will recollect the biggest companies like Google, Microsoft, Apple, Amazon, or platforms

providing services: TripAdvisor, Expedia, Booking, Uber, but the process is vitally important for small and medium enterprises if they would like to achieve competitive advantage in a market niche against the giants.

The core, the crucial component that will bind all these ingredients is the people. Will they be able to use the new hardware? Are they capable to apply the software? Will they be willing to share their knowledge in the cloud? What are their motives to participate in a network? How protected do they feel when using the e-commerce channels? How sound are the decisions made on the move? The wellbeing of people is driving development in society and business.

Having in mind the humanistic approach and in an attempt to obtain the whole picture from separated puzzle pieces, the pragmatic and holistic definition is selected in this paper.

Digital transformation is adopting a new mindset and company's culture for implementing the newest digitized technology advancements. It aims to create higher value for customers, invent information-based products and services, optimize operational processes, use efficiently the resources, increase digital literacy and relations between employees and develop a sustainable business model that establishes competitive advantage.

3. INSTILING DIGITAL MINDSET IN STRATEGY

Kaplan and Norton's (Kaplan & Norton, 2004) model of a company's strategy map is a useful tool to frame the discussion on digital transformation. It reflects the ability to respond to the challenges of the information era when the ability to exploit intangible assets becomes as important as the effective

management of physical capital. Moreover, this management system covers the strategy formulation but also its implementation. The execution of transformation is as important as drawing a new picture of the future. The model binds the vision, mission, core values, and strategy of a company with four different perspectives: financial, customers and stakeholders, business processes, and organizational capacity (knowledge and growth).

3.1. Laser-focused vision and mission

Companies approach the creation of a new vision for the future from two different perspectives. The first one is of the companies, which were or will be “born digital”. They are free of the shackles of the past and can unleash their imagination but might fall into a trap of unrealistic expectations. At the same time, they might be blindfolded by a specific technology trend or new product and abandon a holistic approach. The second group is of the established companies that meet very different obstacles. The management of these corporations has to overcome the willingness to preserve the already created image. A clear metaphor will be a painter who has considered his workmanship a masterpiece but is forced to redraw a new image on the same canvas. Digital transformation is about challenging one’s own beliefs, assumptions, and core values about oneself. It is easier to draw on a blank sheet but more complicated to reinvent, reshape the processes that may even work well at the moment to match the changes in the environment.

The creation of a vision for the digital era is the responsibility of the company’s top executives. The lack of clarity about the company’s vision undermines the process of digital transformation. Specific pitfalls

in creating a company’s vision nowadays are how a cold-minded, rational approach of technocrats’ ideas to be converted in an aspiring, emotional stimulus to reshape the organization. People, not technologies should decide what constitutes a good life. The vision has to harness the innovators, convince the doubters, support the laggards.

In essence, the vision of companies that will reflect the path to digital transformation should cover the wellbeing of people in the future. Intentionally the eloquent example is from a non-profit entity: the Wikimedia Foundation’s vision. “Imagine a world in which every single human being can freely share in the sum of all knowledge. That’s our commitment” (Wikimedia Foundation, 2021).

The mission of a company is more deeply grounded in the reality. It aims to reveal the unique competencies that differentiate the firm in terms of e-business products and services. It clearly defines how the marketplace is converted towards an online ecosystem and how the company creates and sustains its competitive advantage. It also sets top-level goals: attracting new customers, increasing consumers’ loyalty, spurring innovation. The mission will depend on a specific industry but the essence should be about people. Digital transformation is rooted in people’s minds and how the consumers, stakeholders, employees will accept and implement it is crucial. If the company moves too fast, the changes do not reflect the concerns, interests of involved parties it is a recipe for failure. Either the product is far ahead of its time or the benefits proposed by a new service are considered not so different from the one that is already in use. Even digital innovators like Apple and Google are not immune to such missteps. In 2014, Apple announced that their new iPhone6 would use the super-tough Sapphire screens. The

technology required to bake sapphire bricks in a furnace for a month and then slice them into sheets for phones. The required production time leaves no chance for Sapphire screens. In 2019 the electric cars aficionados have to wait at least 17 months to see their new Tesla 3. In a three-year period 1996-1999, GM sold just 1117 of their first mass-produced electric car's model EV1. From September 2016 until April 2018 Google tried to promote their own messenger application Allo. The service is not a default application in Android smartphones and customers have to download it but they do not recognize any advantages to already widely used apps like WhatsApp, Facebook Messenger, or iMessage. Apple and Ford are ahead of the times, Google is behind. In both

cases, it is the customers who make the final decision.

3.2. Big data – a navigation tool in a reshaped environment

Defining the digital transformation strategy is preceded by an analysis of the external environment. Bennett & Lemoine describe this environment in a two-dimensional coordination system along the axes “available information - opportunities to predict outcomes”. Thus, they define four key characteristics of the external environment that impact companies: volatility, uncertainty, complexity, and ambiguity. The acronym VUCA is often used (Bennett & Lemoine, 2014). The terms are defined in Table 1.

Table 1. The matrix of characteristics of external environment*

		Available information	
		Low level of knowledge	High level of knowledge
Opportunities to forecast outcomes	Convolutad reality	<p>Complexity</p> <p><i>Characteristics.</i> Interconnected elements form a sophisticated system. Some information can be predicted. Not necessarily involving change.</p> <p><i>Approach.</i> Restructuring of internal company operations to match the external complexity.</p>	<p>Volatility</p> <p><i>Characteristics.</i> Information is at hand, but sudden events occur and their duration is unknown. Unstable change.</p> <p><i>Approach.</i> Agility, resource stocks for future flexibility</p>
	New reality	<p>Ambiguity</p> <p><i>Characteristics.</i> No precedents. The “rules of the business” have changed. Cause and effect are not understood.</p> <p><i>Approach.</i> Experimentation of new strategies. Formulation of hypotheses and their testing.</p>	<p>Uncertainty</p> <p><i>Characteristics.</i> Cause and effect are understood but the scope and speed of change are unknown.</p> <p><i>Approach.</i> Information has to be collected, evaluated, and shared.</p>

* Adapted from Bennett & Lemoine (Bennett & Lemoine, 2014)

This model is further complicated by the processes observed in the digital world. In contemporary conditions, changes are occurring in the speed of processes, in the volume, diversity, and reliability of data available for decision-making. Business

analysts like to use acronyms that allow them to outline the main features of a phenomenon in relatively short terms. Speaking about big data the IBM data scientists introduce the acronym 4V's: velocity, volume, variety, and veracity.

The volume refers to the amount of data that exists and is created. The scientists calculate that in 2021 every day the world creates 2.5×10^{18} (the term will be quintillion) bytes of data or 90% of the data in the world is collected in the last two years. Taking pictures and videos is easier than ever, using credit cards, sending emails, publishing in blogs, messaging in tweets, posts, likes, website clicks are daily activities for people. Companies collect readings of our electric, water, heating meters, follow the GPS smartphone signals, purchase records and collect data about production processes from internet of things (IoT) devices, medical procedures. Government agencies are tracking the climate conditions, air pollution, traffic video surveillance on the road, educational and scientific activities. That is not even a shortlist. And the volume is rising.

Velocity reflects the speed of creation, transferring, and analyzing the data. Real-time data are streaming. Wearable devices are abundant. The data comes from sensors (IoT), cloud, social media platforms, traditional databases. In medical equipment, the velocity of data could be the line between life and death. In transoceanic pipelines between accident-free operation and environmental disaster. In financial services between ordinary transactions and cunning fraud.

Variety concerns the structured and unstructured data, the file format of the data. When one saves a file on a personal computer a whole list will appear. As users, we are familiar with file extensions like pdf, xlm, xls, doc, cvs, jpg. At the same time, laymen have no clue how the data from a pacemaker or a diabetes tracking device are converted into digital signals available at remote centers. It is estimated that 85% of the data is unstructured from disparate sources. Deriving value from

such data is a cumbersome process but is crucial for the success or failure of the company.

Veracity reflects the quality of the data that will be analyzed. It concerns the trustworthiness of the source of data, the context, the algorithms used to derive value. Removing abnormalities, duplication, and expectation bias are of crucial importance. Primary market research is a clear example. Is the data to the problem being analyzed? Non-verified, non-related data clog up information channels, waste money and time, and hinder good decision-making in a company.

These characteristics of the environment and available data in the digital world significantly influence the strategy formation process.

In this article, an operational definition of strategy is a complete contingent plan of actions that will map the journey of a company from a contemporary state towards the desired future. The organic weaving of the digital component into the strategy should reflect the use of new technology and software solutions to create differential value. It covers all four perspectives.

Transformation of the strategy to reflect the digital world should improve the leveraging of the company's capabilities and resources and design a new customer experience. The application of the strategy maps model allows to link the mission, core values, and vision of the organization for the future with the strategy, priority objectives, changes in the monitored indicators (leading and lagging), and the necessary actions to be taken to achieve a sustainable improvement of the company's competitive position. It allows us to highlight the specific characteristics of the four main perspectives of the company's activity: financial, customers and stakeholders,

business processes, and organizational capacity.

3.3. Digital transformation of organizational capacity

Digital transformation of organizational capacity (knowledge and growth) consists of three interconnected facets - human capital, information capital, and organizational capital.

Human capital management aims at two specific goals. The first one is to motivate the employees to achieve the company's objectives as effectively and efficiently as possible. The second one is to create opportunities for personal and professional growth of the individual. Kirantchev justifies in detail the interconnection of these two goals (Kiranchev, 2021). Both are rooted in personal mentality. Personal traits as adaptability, empathy, motivation, and technological understanding. It is about how people perceive change and innovation, including digital technology. Some are afraid of implementing these technologies because it could jeopardize their jobs. Others are worried that the deployment method is based on trial and error, on experimentation. Third experience cognitive barriers to making sense of the flood of information that inundates them and taking a timely decision. Abandoning the routine of formed habits requires a conscious effort. At the same time, new generations are digital natives. Attracting, retaining, motivating the talents among them supports the implementation of new digital solutions. In many industries, information technologies enable work processes to be carried out from anywhere, anytime, at any device. Knowledge transfer facilitates the self-organization of agile teams on specific projects. Information sharing overcomes traditional functional and process silos and changes the decision-making process at both

strategic and operational levels. The speed of change makes it necessary to delegate more responsibilities to employees who interact directly with customers. The US e-commerce company Pitney Bowes is a vivid example of targeted staff training. The company identifies 10 functional areas: mobile, data, analytics, machine learning, application programming interface, software-as-a-service, designing a user experience, etc. In each of these areas, the company develops a curriculum. Each employee has to choose one of the courses and devote a year to learning them. Through this targeted training program in mastering digital competencies, the company not only achieves a change in the mindset of the individual but also an expansion of mutual assistance between employees in mastering the respective field, an expansion of contacts between them, and an awareness of personal contribution in forming value for the customer. Proactive training is proving to be a highly successful strategy for the company. The digital transformation of a company's strategy should empower people to achieve strategic objectives.

Information capital also manifests itself in different aspects. It reflects the hardware infrastructure, the data management by application of specific tools to collect, store, process and analyze the data, creating networks and platforms. In the digitalization process, information capital acts as a catalyst for business strategy. It manifests itself differently in industries where information technology (IT) is not part of the final product but of the technological process of its creation (food, metallurgy, chemicals) and in sectors where the product functions include the ability to collect and process data (electronics, telecommunications, financial services). Entrepreneurs intuitively are aware of the

fact that information systems (IS) cannot be perceived just as effective and efficient tools to increase productivity. IS are not evolving independently within the enterprise and are not ancillary to the creation of competitive advantage. Even the concepts that tangible results can be achieved by implementing the latest IT solutions in e-business are beginning to lose their relevance. Teubner in his academic research identifies these three phases: management IS, strategic IS, and e-business era (Teubner, 2013). Modern times are characterized by new trends. The current IT solutions are social, mobile, analytical, located in the cloud. They include IoT, augmented and virtual reality, machine learning, artificial intelligence. Miniaturization, expanding network connections, keeping the connectivity “always-on” are changing the way people conduct business and their personal lives. Information technology becomes ingrained in everyday life and one ceases to even notice it except when a temporary disruption occurs. We are witnessing the formation of digital ecosystems. These include smart and interconnected products or services, the need for collaboration between companies from different industries, and the building of networks whose efficiency increases exponentially with the number of participants involved. Dynamic digital ecosystems combined with the information infrastructure of companies “raise a new set of strategic choices about how value is created and captured, how companies work with traditional and new partners, and how they secure competitive advantage as the new capabilities reshape industry boundaries” (Porter & Heppelmann, 2014).

When it comes to organizational capital in the company, the leadership role of the chief executives in changing the business

model is unquestionable. Systematic efforts to adapt the company to the realities of the digital world cannot be enacted without the involvement of senior management. One must consider the contradiction that exists between the willingness of leaders to take responsibility for the risk faced by the company and the potential opportunities to realign its operations with the new realities. Digitalization is not a one-off act. It requires a systematic effort that combines maximizing the financial results for shareholders with developing the company’s organizational capabilities. Leaders must succeed in creating an atmosphere to enthruse the performers of specific tasks to adopt a new style of working. They must develop the potential for employees to adopt new technological solutions and implement digital innovations through experimentation. Leaders must be able to combine the company’s core values and translate them into individual values for each of the employees. To accomplish this objective requires strategic thinking, but also the ability to listen to the ideas that are born in the process of work, to encourage employees to take responsibility for their part in the digital changes that are occurring. The creation of an atmosphere of honesty and trust, the teamwork should also be combined with the application of material incentives for the implementation of digital solutions, for the conscious improvement of skills to work in a digital environment. Special attention should be devoted to the development of dynamic capabilities: sensing, seizing, and reorganizing. Sensing reflects the ability to forecast change, “feel the heat around the corner” and to learn quickly. Seizing is a process of realigning resources to grasp the identified opportunities and extract value. Reorganizing is a fundamental change across the whole company to reshape the processes,

optimize the usage or attract new resources and abandon the routines and adapt to a new reality.

Human, information, and organizational capital are internal drivers of digital transformation. Enthusiasm, willingness to embrace innovation, strategic mindset is at the heart of forming and implementing a successful digital transformation strategy.

3.4. Digital transformation of business processes

Business processes are the second considered perspective that refers to the internal activities of the company. Digital transformation encompasses operations management, customer management, innovation processes, and social and regulatory processes.

Operations management (OM) is one of the sources of the competitive advantage of the company. Kiranchev applies an original approach based on the game theory toolkit to define optimal business strategy under conditions of unknown competitors' actions (Kiranchev, 2021). OM reflects the internal company systems and covers applied technology, productivity, costs, quality, flexibility. Digital transformation is observed in each of these elements. The technology is based on IoT, automatization, and robotization. Productivity increases based on gathering and processing real-time data about the production process and the ability to correct unintended deviations immediately. Costs are reduced through the use of new materials, miniaturization of products, cutback of machine downtime, implementation of just-in-time resource delivery systems, and optimization of raw material processing to reduce waste. Quality control is carried out continuously, at every stage of production,

minimizing the amount of scrap and saving the cost of further processing of a product that has shown defects or reworking of an already finished product. Flexibility is increased on account of the automated adjustment of the technological equipment to produce different types of production. These trends are manifested in manufacturing. The digital capability center in Aachen (Kusters, et al., 2017) demonstrates the application of digital transformation in the textile industry for small and medium-sized enterprises. Employees are equipped with a smart wristband with a radio-frequency identification (RFID) chip that allows human-to-machine interaction. The machines are automatically reprogrammed based on personal identification, the rights to fulfill specific operations are adjusted, access to instructions is provided based on the worker's training level. The real-time data are visualized on an employee's computer, tablet, or smartphone. Sensors are constantly monitoring the process of warping and submitting data about yarn tension and knots, abrasion, humidity, temperature, and light. This speeds up the response time when quality deviations are detected and allows the formation of a database of decisions that can be analyzed and applied in the future. There are other digital solutions to customize the product, in assembly and logistics. A systematic approach to business strategy should reflect the innovations in production, supply chain, distribution, and risk management as elements of OM.

The customer management process deals with the selection, acquisition, and retention of product users. Digital transformation empowers the user by providing detailed information about the product, its features, functions, upgrade options, maintenance conditions. The buyer can easily and quickly compare the

offerings of different manufacturers in terms of specification, quality, price, get to know the reviews and ratings of customers who have already acquired the product. This new reality presents companies with the challenge not just to market their products, but to build a relationship of trust with consumers by influencing their minds and emotions from the moment the idea of purchase is conceived, through research, ordering, payment, and support in using the product. IT not only underpins the development of customer relationship management systems but also allows connections to be conducted through a variety of channels, at any time and from any location, wherever in the world it may be. New criteria for segmenting markets are emerging. In a globalizing world, this is the technographic segmentation that reflects the behavior of users online, whether as content creators, participants in discussions and debates, passive observers on social networks, or isolated from online communication. At the local level, geo-locational segmentation is observed - tailoring a specific offer to customers who are located in a particular geographic region or city district. Data analytics allows companies to explore the specific needs of customers, customize product offerings, make sense of and anticipate changes in consumer preferences. Providing feedback channels helps create long-term customer relationships. The use of social media engages product users and turns them into company advocates. Danish toy producer Lego is a company that can be seen as a shining example of the importance of customer relationships. On the brink of bankruptcy in 2003, embarking on a digital transformation, Lego in 2021 is the largest toy manufacturer in the world. At the heart of the company's restructuring is an in-depth

ethnographic study of how children around the world really play. Robotic toys based on a programmable building block and products that combine modern trends of mobile applications with standard Lego blocks are created. By scanning the physical elements, children can build their own structures in a virtual environment. The company actively communicates with passionate Lego consumers in an online environment by encouraging them to make suggestions for creating new products based on existing Lego components. When a particular idea is massively supported, the product is put into production. Lego makes active use of fan pages, social networks, with almost all content on them generated by users. Both abstract analyses and practical examples prove that customer management is a solid foundation upon which the company's digital business strategy should be formulated and implemented.

Innovation in the digital world is associated with the new features that software products add to physical devices ("smart products"). A prime example is a contemporary smartphone. The programs installed on it by the manufacturer are perceived by the modern user as a necessity for the functioning of the device. They change the very nature of the product, blurring the boundaries between individual products. The smartphone that you hold in your hand is, in addition to a telephone, also a compass, a flashlight, a road map, a calendar, a notebook, a calculator, a scanner, a device for playing music, for accessing the Internet, a video camera, a video screen, a projector, a credit card. The list can be extended. And with the addition of apps from external vendors the range of products it can replace is increasing. The Swedish furniture producer IKEA successfully merges its bricks

and mortars activities with digital customer experience. Its app, based on virtual reality was first introduced in the stores. It allows buyers to visualize how the piece of furniture will fit in a room. At a second stage by adding artificial intelligence customers can scan their home, one room at a time, create a 3D model, and allocate the furniture according to the design that the user envisions and best reflects his needs. And it will be achieved easily anywhere via one's iPhone or Android.

The process of merging the physical and virtual worlds has its social consequences. Users have the right to choose which of the proposed options to select among the various possibilities. The channels of communication between individuals and between individuals and organizations are also changing. Expanding the ability of devices to communicate with each other without human intervention gives rise to an ecosystem that should be conceptualized in future research of business strategy. Currently, the company's digital business strategy should consider the fact that the value of tangible products is largely determined by the possibility to upgrade them through software solutions.

The scope, scale, speed, and interconnectedness of digital transformations pose new risks and add complexity to already existing risks. Legislation and regulations try to address them and protect the consumers and society. Companies' strategy should combine the introduction of digital innovation with the implementation of regulatory requirements for doing business, especially in sectors subject to increased scrutiny: telecommunications, financial services, healthcare. The line between the "Know-your-customer" requirement to prevent money laundering or financial fraud and consumer profiling to personalize the product offering

is extremely thin and blurred. Companies are forced not only to comply with current regulations but also to anticipate upcoming changes in the restrictions of their business. Uber's platform for transportation services was banned soon after its introduction in some European countries based on existing legislation. Software in a medical device helps to diagnose, track and even save a patient's life. Automated, Web-based, remote monitoring of pacemakers and implantable defibrillators sent regular information to the physician and trigger alerts in case of emergency. Recently the number of approved medical devices based on artificial intelligence and machine learning is 222 in the USA and 240 in Europe (Muehlematter, et al., 2021). Regulators, academics, and industry are discussing how to legislate this sector. Lack or modifications in the regulatory framework may hinder the process of introducing innovative digital solutions and require a change in the company's strategy. Bringing autonomous cars to the market is delayed due to a lack of regulatory clarity. Napster, the first peer-to-peer platform for sharing music, was shut down for infringing artists' copyrights in 2001, but its proposed business model for downloading music is viable. As of 2021, the company rivals iTunes, Amazon Music, Spotify. The idea is developed for sharing video, games, apps. YouTube, Twitch, Tencent, VK implement it successfully.

Regulators make serious efforts to ensure legislative changes support innovation. Regulatory sandboxes, outcome-based regulation, risk-weighted regulation, and adaptive regulation are contemporary practices. The so-called "sandboxes" create controlled environments allowing innovators to test products, services, or new business models without having to follow all the

standard regulations. De Nederlandsche Bank supervises the application of blockchain technologies in the operational management of financial services companies. Close cooperation with the regulator mitigates the risks for the consumer. The advantage for the company is to test their product in a live environment. This enables innovators to understand customer reception to novelty and modify their business model.

Interconnectedness and blurred borders between products, industries, and countries also complicate the process of forming the company's strategy. A mere act of paying for a product online consists of retail and financial services components. Claims on product quality will be addressed to the e-store, but on payment failure – to the financial institution. A food delivering drone is a focal point of transportation, e-commerce, food, and aerospace industries. Compliance with regulations of each one of them might be tricky and expensive. Even more complicated is the situation if a company operates on the global market and the legislation differs from country to country. EU policy aimed to harmonize the legislation and create a digital single market that will protect consumers and foster competition. The Digital Services Act and Digital Markets Act proposed by the European Commission are two pillars that will reshape and attempt to create a level playing field for companies in the continent. Globally, several issues that require regulation remain open. To what extent are the decision-making algorithms of artificial intelligence programs known, and what unanticipated results arise from applying inappropriate models or proposing incorrect solutions? How to overcome increasingly dangerous cyberattacks? How can misinformation spread with incredible speed to a wide audience affect

the image of a company or a specific product? What amount of user data is reasonable to be required, how should it be stored, analyzed, shared and when should it be deleted? Can hyperconnectivity cause breakdowns in seemingly unconnected systems? The list goes on and on. The company must address and respond to each of these to ensure its success.

3.5. Digital transformation of customer perspective

The customer perspective is an external viewpoint on a company's activities. It is strongly influenced by the changes occurring in the environment. Users are affected in their decision-making by the avalanche of big data flooding them and its described characteristics: volume, velocity, variety, and credibility. At the same time, the consumer perspective is the field of the fiercest, mouse-click-away competition between companies. If the strategy of cost reduction is the most pronounced in the business process area, product differentiation and the definition of niche markets are directly related to user perceptions. It is the consumer who has the final say on how far differences in product features or design would induce him to buy.

Customer-centricity becomes a game-changer of a company's strategy and reorients the activities from products, resources, or processes to attraction, retention, and satisfaction of users. "Customers today are more demanding than ever before, are more information empowered to make their own decisions, and want their needs met immediately, perfectly, and for free" (Bhattacharjee, 2001). This statement was written exactly 20 years ago. Meanwhile, one witnesses the eruption of data and technology innovations. Superior customer experience

is a differentiation strategy that is hard to be replicated. The essence of the concept is not just to understand the rational and emotional motives of consumer behavior, but to anticipate one's needs.

Big data mining provides a tool for even small and medium-sized businesses to solve this task. The application of machine learning to the identification of customers' preferences from big data automates the process and makes it far more efficient than standard statistical methods based on polling a sample of users. The data on existing and potential customers makes it possible to construct an individualized profile and offer a customized solution for each client. So, the process of attracting new customers is reframed. Amazon offers an individualized set of products each time one logs to the site. Human curiosity pushes to peek at temptations and this often leads to an unplanned purchase decision.

The study of the contact channels should guarantee a consistent experience for the user regardless of which one he chooses to approach the company: in the physical world, social network, online website, or mobile. Digital natives are demanding, tend to experiment and rotate purchases if the navigation of the company's site is not user-friendly or is time-consuming. They apply an omnichannel approach. At the same time, while evaluating a product in the mall they read its reviews on their mobile phone. Attitude theories such as the technology acceptance model suggest that perceived usefulness and perceived ease-of-use are determinants of this type of human behavior. The company's digital strategy should engage customers holistically through different channels. Disney adopts this approach by providing a tool "My Disney experience" via browsers or a mobile app. In one place customers have access

to every product related to a brand: films, video games, cartoons, toys, music, vacation planning tickets to theme parks, hotel reservations, access to the photos of their children with cartoon characters, coordinating details with family friends, etc.

The variety of forms of communication makes it possible to track both directly - from the received recommendations and complaints, and indirectly - through the analysis of user-generated content (reviews, comments, online forums, photos, videos) the consumer's attitude to the product. Applying machine learning, natural language processing, sentiment, and intent analysis the company can identify, monitor, and undertake policy adjustments about the key aspects of the product and brand that the customer cares about and his expected intentions and reactions. Unstructured data has to be processed to extract meaningful information about consumer feelings and behavior. Consumer recommendations are a more powerful tool to attract customers than an annoying advertisement. People trust online reviews as much as a personal recommendation and will read them before conducting a transaction. Customer feedback metrics are often considered a credible indicator of customer loyalty and future firm performance. Customer effort score (a scale between 1 - low effort to 5 - high effort) and Net promoter score (the percentage difference between the promoters and detractors) that are based on a single question are widely used. The first is a lagging indicator focused on the past and current performance of the company, the second is a leading one heeded for the formulation of the company's strategy. Delighted customers will more likely spread electronic word-of-mouth that will attract new

customers and lower the retention rate of competitors.

Customer retention is closely related to brand loyalty. Creation of brand communities in social media impact all four main Keller's brand equity dimensions in brand identity (awareness), brand meaning, brand response, and resonance (Keller, 2013). Technological artifact – website, the social media group has to create a sense of human closeness and sociability. By providing a topic, enabling and encouraging customer-to-customer conversation the company engages them with its activities. Individual contacts and networks in social media of the company with its customers, partners, employees, or any other stakeholder have to generate and sustain trust. Trust is a key factor in customer relationships. Together with competence, they are regarded as atavistic instincts. Meeting a person, at first glance, one has to evaluate if the stranger is a threat and if cooperation with him will be beneficial. Consumer trust relies on the capability of the company to supply a product with the appropriate functions and design, highest quality, reliable, durable, and serviceable, at the expected price. Online brand community support deepens the relationship between the company and the customer with a focus on strategy.

Anticipation of customer needs and close cooperation at every stage of a product life cycle in design, production planning, construction, operation, maintenance, reuse, and disposal, is the core of the German automation company ABB's research on digital twins. The digital twin is an "evolving digital profile of the historical and current behavior of a physical object or process that helps optimize business performance. The digital twin is based on massive, cumulative, real-time, real-world data measurements

across an array of dimensions" (Malakuti, et al., 2018). The main advantage is a combination of context-specific information stored in a cloud but available at the right time in the right place with any component, system or process twin. Based on sensors (industrial internet of things), big data, virtual or augmented reality, 5G connectivity digital twins enable new business models, information exchange across the value chain, real-time simulation, efficient commissioning, predictive product design, manufacturing, and analysis. Implementation of digital twins will cause a strategy shift toward the effective usage of information. Sharing a digital twin in the cloud will allow experts to combine their knowledge. The impact on the efficiency and competitiveness of the company is unquestionable.

Formulating a strategy that encompasses product or service attributes (functionality, quality, availability, price), customer partnership, and brand loyalty is the foundation for companies to achieve success.

3.6. Digital transformation of financial perspective

Traditionally, within the financial perspective, two areas stand out in company strategies. The first focuses on cost control and productivity improvement. The second relates to revenue growth strategies. Of course, the two are not contradictory and can be successfully coupled and the question is rather which one is prioritized.

Mass production of a single type of output emphasizes cost reduction as the main strategy for achieving competitive advantage. The Japanese car manufacturing company Toyota's lean system is accepted as a benchmark and is applied by many Western companies. It involves the standardization of

work to eliminate waste at each stage of the production process, remove variation in the execution of certain procedures, or overload people and machines.

Anything that goes beyond the minimum resources and labor required to add value to the product is considered a waste in applying this form of organization of the working process.

- The production of assemblies, parts, components that cannot be immediately incorporated into the final product leads to increased costs for their storage and uneven material flows.
- Minimization of waiting time due to poor coordination of schedules, too frequent machine changeovers.
- Eliminating the redundant path for transporting parts from one workstation to another.
- Product over-processing - all operations that do not bring value to the customer, usually related to inappropriate design of the parts or the tools to process them.
- Maintaining a level of stock that exceeds the quantities required under the just-in-time principle.
- Elimination of redundant movements of the operator caused by poor workplace organization.
- Quality control that promptly removes defective items to prevent their further processing.
- Neglecting the creativity of the employees, to improve the working methods. The offerings of the immediate existing workforce require no capital investment, can be easily implemented, and their adoption increases staff loyalty and commitment to the company.

Applying just-in-time cost management requires eliminating observed fluctuations,

irregularities and creating a continuous flow without stagnant pools of inventory waiting to be processed. Leveling the type and quantity over a fixed period of time aimed at overcoming fluctuations in demand for the final output, in the production of a mix of models in each batch, in keeping with the principle of working slowly and consistently.

Overburden of people and machines leads to stress and breakdowns or faster wear-out. Worker overload can be caused by lack of sufficient training, uneven distribution of tasks among individual performers, improper workplace design, unclear instructions for performing operations. In the case of machinery, overloading can occur due to an improper selection of equipment, postponing major or routine repairs. Any of these causes is an obstacle in the way of cost reduction.

The company's digital business strategy to reduce costs also includes the use of discounted resources that originate as a by-product or even waste in non-related industries. This can be achieved by applying Data Mining algorithms to detect such resources promptly before they are utilized by the owner. The process benefits both participants in the transaction. The buyer will achieve cost reduction, the seller will derive value from an "unusable waste".

Asset utilization is also a source to increase productivity. Physical wear and tear on machinery and control of replacement times have always been a focus for management teams. When weighed against the expenditures of acquiring new equipment, this is the basis for investment decisions. In a dynamic environment, accelerated obsolescence of assets leads to an increase in production costs compared to competitors. There comes a point when, although the equipment is physically fit, it is economically unviable for

the company to continue using it. Certain equipment may also have to be abandoned due to changes in the regulatory framework. In these cases, the forced replacement of equipment is associated with the elimination of risks (safety, healthy, environmental) to machine operators or customers, or even the inability of the company to carry on its business. The increase in consumer demands also gives rise to situations where installed capacities cannot be readjusted to produce the new products. A situation arises in which the company has to select assets with the functionality to adapt quickly and easily to market changes. Big data allows a company's strategy to be formulated to replace manual operations with automated processes, monitor compliance with production technology and machine maintenance in real-time, generate forecasts on the need to replace certain units and identify opportunities to extend their life cycle.

The observed developments in business processes: robotics, IoT, smart manufacturing provide more accurate data based on which the cost reduction strategy can be successfully implemented. At the same time, frequent product innovation and consumer demands for product customization imply deeper contacts between stakeholders in the formation of the value chain. Coordination between the different actors in the network of interconnected suppliers, manufacturers, distributors is the way to achieve a reduction in the overall costs in this network, which can be distributed among its members according to the contribution to the customer value. "Domino effect" of loss of customer value or "Butterfly effect" of its increase will resonate in the network affecting its members. Sharing economy in travel, finance, music, and video streaming illustrates how digital

transformations actually by cost reduction and asset utilization influence the wellbeing of stakeholders. Peer-to-peer car sharing optimizes the use of personal vehicles, while business to crowd model like that of the Bulgarian company Shark combines the benefits of using a new eco-friendly electric vehicle, eliminating the hassle of downtown parking, accessibility to service 24/7 at various destinations.

Growth strategies in the information age redefine the value creation process and the time frame. Sustainable value is created for three intertwined groups - customers, employees, and shareholders. Understanding the unique customer needs and the speed they reshape is linked to employees' creativity, commitment, and dedication, and investors' returns. If the interests of all of them are aligned, motivated, well-trained staff will deliver quality and in-demand products or services and along will increase the revenue and profit margin. Prudent investors will allocate the necessary resources to R&D and foster innovation.

The ability to track user behavior alters attitudes towards perceiving the time horizon. Financial indicators are lagging. They reflect the profitability, liquidity, turnover, debt, and market ratios looking backward. Digital transformation and big data realign the focus to the future. The company's financial strategy is oriented towards defining customer lifetime value – a forecast of total net income a business can expect to obtain from a customer over one's entire relationship with a company. Profitability projections based on purchase history are complemented with the metric about the ability of the company to retain the client, suggest actions to deepen contacts with him, to influence his behavior. Increasing by small increments individual

customer value will impact the company's growth. Usage history, loyalty, contacts with the brand have a direct impact on financial performance but also provide valuable insights into the customer journey process. Real-time analytics of customer lifecycle information allows taking appropriate corrective actions in the relationship with the consumer. A company can formulate data-driven strategies that allow inducing an increase in consumption by stimulating buyers' reward systems, up-selling, cross-selling, and loyalty programs. That will affect the financial results directly. Indirect consequences on profitability should not be ignored. More customer referrals, escalation of user-generated content, reviews, ratings support the efforts to attract new consumers – the cornerstone of company growth.

The outcome will be even higher if it is achieved in a network of firms that are oriented to meet customer expectations. Digital products are reproduced at zero marginal cost and network externalities create value with every new user. The concept of value creation expands from utilitarian value – product application, price to emotional value – superior user experience and social value – the interaction with other stakeholders. The firm that delivers a service usually extracts the emotional and social value created by stakeholders. Platforms like Airbnb, Booking are examples that easily spring to mind.

Digital transformation processes give birth to new forms of securing funds. These include crowdfunding platforms that help raise investment for startups; online crowdfunding, peer-to-peer lending, facilitating borrowing

funds without the involvement of banks; smart contracts – the automatic execution of contracts between buyer and seller when the predefined conditions are met, etc. For entrepreneurs, small and medium enterprises, start-ups, these innovations allow not just the launch of the business but also significant savings on transaction costs, and opportunities for accelerated growth.

A company's digital business strategy must balance between productivity gains rooted in cost containment and growth based on increasing customer value.

4. TYPOLOGY OF DIGITAL STRATEGY ADOPTION

Companies' approach to digital transformation is determined by several factors. Among them are: the sector in which the company operates, the stage of its life cycle, the company's articulated vision and mission, the business model applied, the management style, the creativity and experimental spirit of employees, the expected results of the implementation of innovations, the risks and challenges that will arise, the amount of investment required.

A typology of digital business strategies is proposed in terms of two dimensions. The first one is the adoption of products and services that incorporate modern digital technologies. The second one is the creation and implementation of a consistent strategy to achieve digital transformation. Two stages in each of these areas are assumed – low and high. Four types of companies will be identified and they will be denoted as primordia, traditionalists, experimenters, and drivers.

Table 2. Typology of digital strategies adoption

		Creation and implementation of digital business strategy	
		Low level	High level
Adoption of digital products and application of digital technologies	High level	Experimenters	Leaders
	Low level	Primordia	Traditionalists

The primordia are companies that make their first steps on the digitalization journey. The products they produce are not affected by digital innovations. Agriculture and forestry, mining and quarrying, water supply have to ask for opportunities to modify the product range offered. Decades of established manufacturing practices suggest a rather conformist spirit among staff, with new developments being accepted skeptically. The nature of the activity suggests that these are business-to-business (B2B) companies but this group can also include micro and small enterprises operating in the business-to-consumer (B2C) segment. These enterprises are influenced by current trends of disruptive technology and modern attitude towards clients. As a result, they undertake steps to innovate the production process and modify customer relations policies. Being at an early stage of awareness of the forthcoming transitions, they do not have a clearly articulated long-term vision and strategy for managing digital transformation processes. The introduction of new technologies and sometimes sophisticated software CRM, ERP systems, e-commerce sites are oriented to solve specific operational tasks. Very often the investments are not focused, the programs used are not interconnected to extract their full potential. The main challenge

these companies will meet will be to create a clear vision about the future. The risks will be associated with the company's cultural shift: overcoming employee inertia, establishing a sustainable relationship with stakeholders, reducing environmental, health, and safety footprint.

The traditionalist group includes companies whose business model and image are built on a unique handmade product or limited quantities. These are mainly fashion and luxury goods. Brands associated with jewelry, watches, clothes, shoes, accessories, chocolate, and wine are positioned in the consumer's mind as unique. (Cartier, Rolex, Gucci, Louis Vuitton). Small boutiques also operate in this market. All of them are from the B2C segment. Employees are creative. Focused on niche market segments, these companies build perfect communication with their customers, ensure an exciting consumer journey, and show a willingness to realign to buyer requirements. Globalization processes play a significant role in their growth but also necessitate effective supply chain management. Influenced by these factors, companies are formulating a data-driven digital transformation strategy, but it is not considered crucial for the business. The brand is their fundamental asset and its particular focus is to sustain customer loyalty.

The specific segments these companies serve – the people who care about their image and influence in society, require the company's vision and strategy to link the heritage and tradition with modern lifestyle, to dedicate itself to environmental and social causes: reduction of CO₂ emissions, abandoning animal fur as material, use of recycled materials, establishing minimal age for employees. The risks for these companies relate to the ability to successfully implement online sales models. They undermine individual contact with the customer and the perception of product uniqueness. A personalized digital experience of the quality consumers are accustomed to in a boutique will be expected. In addition, the generation of digital natives has not yet entered the market. It is difficult to predict the extent to which traditionalists' products represent value to them.

Experimenters are companies that either launch innovative products, develop a new service for clients, or introduce new technologies. Some of them are born digital, but there are analog behemoths that understand the modern trends and apply digital technologies to strengthen their competitive position. Startups disrupt a lot of sectors by redefining value propositions. Financial services, education, health care are redesigned. Revolut – a digital UK banking app, Kide Science – Finnish platform oriented to play-based learning for pre-school kids, Electron Cardio – Bulgarian producer of an online Holter monitoring system reshape the landscape. Companies reside in B2B and B2C sectors. Usually, a strong vision for the future is a driving force. The employees are well educated, devoted, apply an agile approach to convert a minimal viable product to a cutting-edge service that meets the clients' needs. Talent is easily attracted to work

hard to convert an inspiring idea into reality. The product usually is applicable globally with minor adaptations. The network effect when every new user contributes to value creation is manifested. The challenge in front of experimenters is the autonomy of tech teams if they are focused on engineering or program code excellence and underestimate the monetization of the idea. Startups have no clearly defined sustainable business model. Digital innovation requires a shift in the established business model of analog behemoths, but they find it difficult to part with established practices. Experimenters face the lack of a precisely determined digital transformation strategy. The serious risk they confront is the lack of sufficient financial resources to implement innovative solutions and scale-up.

Leaders innovate their products regularly. They set the pace in digital innovation. At the same time, they have an inspiring vision and mission, a precisely formulated company strategy and implement it successfully. They operate in sectors: information and communication, manufacturing, electricity, retail trade, pharmaceuticals, etc. B2B, B2C, B2G markets are covered. Financial stability allows them to allocate a lot of funds in research and development to foster innovations. Investments are aimed to sustain a digitally consistent business model. They regularly scan and acquire companies that will help them achieve synergy and increase profit margin. Leaders anticipate customer needs, have access to big data that allow them to profile the customers, individualize the offers. Advanced analytics helps to dig even deeper. Forecasts on future trends are developed applying sentiment and intent analyses. They derive the highest portion of network benefits associated with a larger user base, active

interaction, user-generated content. Staff training programs are actively implemented to stimulate creative thinking. Companies create a culture to nurture digital transformation. Human resources provide opportunities for rapid growth and global expansion. Leaders apply all the modern technologies: artificial intelligence, augmented and virtual reality, blockchain, IoT, mobile channels, robotics, and drones. Their brand equity is high. Voices are raised to criticize them for restricting competition, the consumer's right to choose, unauthorized use and dissemination of personal data, discriminatory practices. The risks for them are provisional regulatory amendments. So far, Leaders can create and sustain a digital competitive advantage.

5. CONCLUSION

A clear definition of the digital transformation process allows theoretical developments to be applied in the practice of companies. Formulation of crystal clear "techphy" vision and mission is a solid ground to formulate a digital business strategy. It should cover the four perspectives - financial, customer, business processes, and organizational capacity. In each one of these perspectives, specific objectives arise. Coordination is of crucial importance to achieve strategy implementation. The typology of digital strategy adoption is a tool for managers to approach the process systematically. As a theoretical construct, typology needs to be empirically tested, and this is an area of future research.

Companies that succeed in digital transformation are more productive, efficient, customer-centric, technologically advanced, knowledge-based, and therefore more competitive.

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