

Management Challenges in the Age of Digital Disruption

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Abstract— Accelerated global market shifts and digital economy have become a reality. Digital economy is growing and evolving fast. Digital technologies have made much easier access to global capital, talent and other resources. Emerging markets companies have become global competitors for established firms from developed countries. The article presents the results of the research of digital disruptors and their impact on different business spheres. For the purpose of the current article digital transformation is understood as a multilevel technology-based change in the firms that includes both the exploitation of digital technologies to improve existing processes and their efficiency, and the exploration of digital innovation, which can potentially transform the business model. Digital technologies have changed both central targets of any company: customers and the markets. It was concluded that in order to succeed in digital transformation firms' organizational structures should be reorganized from hierarchical decision-making and toward a network team based flexible agile structure.

Keywords: *digitalization, digital transformation, digital disruption, multinational companies, management challenges, new digital leaders*

I. INTRODUCTION

Accelerated global market shifts and digital economy have become a reality. Digital economy is growing and evolving fast. The active usage of information and communication technologies (ICT) in all spheres of business has become a "global megatrend" [1]. Dynamics of digital economy is higher than that of global GDP. Now the size of the digital economy ranges from 4.5% to 15.5% of world GDP. The size of total worldwide e-commerce in 2018 exceeded \$29 trillion, equivalent to roughly 19% of all global sales. The global digital flows are more important than FDI flows. Digital technologies have become the driver of transformation of the economy and society. The today global economy is characterized by greater consumer cost-consciousness, transformation of industries, globalization of markets, and greater business uncertainty and risks, sluggish growth in the developed countries, a shift of economic power to the emerging economies, and value-driven customers and rising risks everywhere. Markets have become turbulent and customers are changing very fast, so companies need to adopt to the unstable business environment.

Digital technologies have made much easier access to global capital, talent and other resources. Emerging markets companies have become global competitors for established firms from developed countries.

Among the companies that have undergone digital transformation, there are so-called "superstars" that have a significantly larger share of income than competitors. "Superstar's" earnings represent 13 to 15% of the entire global corporate profits and 22 to 25% of all corporate earnings worldwide. New global information companies have appeared, surpassing older TNCs in dynamism and market influence. The top 10 new global digital transnational corporations by market value have surpassed the top 10 traditional multinationals and become the leading force in the global digital economy development. Among these information TNCs is the group of digital companies such as Google, Amazon, Microsoft, Alibaba etc.

II. THEORETICAL BACKGROUND

For the purpose of the current article digital transformation (DT) is understood as a multilevel technology-based change in the firms that includes both the exploitation of digital technologies to improve existing processes and their efficiency, and the exploration of digital innovation, which can potentially transform the business model. Transformation refers to a fundamental change within the organization, which has a major impact on organizational strategy and structures [8] and the distribution of power [27]. For the purpose of this article digital transformation is referred only to firm's level. Digital innovation, defined as the recombination of digital technologies and physical components to create novel digital products as well to enhance existing physical products with digital capabilities [29], is an opportunity as well potential threat to the firm [11, 16]. Digital innovation involves transformational changes in strategy, processes, and products and thus requires the company to rethink its organizational patterns [29]. The growing importance of digital technology for firms leads to the integration of IT-strategy and business strategy in a common digital business strategy [15]. Companies digitize their processes more than ever before in order to increase interaction with their customers and other stakeholders as well as increase efficiency and reduce operational costs [10]. Digitalization impacts three different

levels: digital products and services, digital processes and decisions (algorithms and Big Data) and entirely new digital business models [3].

The increasing application of digital technologies has been an important catalyst for organizational transformation in the previous decades [30], enabling firms to integrate digital technologies and business processes [21], as well to facilitate key business improvements [17]. Digitalization changes fundamentally pre-existing business models and value chains as well as the whole business [9]. Digital transformation pushes firms to change both internal structures as well business models, being a complicated and challenging organizational learning process [20, 23]. Digital transformation is a change process that should be actively designed and executed [14].

Digital transformation simultaneously affects multiple areas within the firm, influencing marketing, IT, product development, strategy, leadership and HR. Transformation is not a smooth straight forward process, but a rather complicated way. The subject of transformation is of significant interest for researchers, with emphasis what makes them successful [18], and how firms approach their transformation [5].

Previous research on digital transformation [13] reveals that the changes induced by the simultaneous and dynamic influences of digitization on user behavior, organizations, and industries, constitute a new kind of transformation that provides new challenges [5, 8].

The previous research has shown that innovation processes are often constrained by resistance, slow accommodation and adoption [11]. For digital transformation transformational leadership is pivotal, which is based on considering the needs of the followers, that is the employees, and gaining their trust, so that they are open to change. IT department is no longer entirely in charge of digital innovation, and employees outside IT also innovate with digital technologies [24] as well increasing IT-knowledge of executives is important [25]. Digitalization creates are multiple challenges for the firms, including the alignment of business and IT [22], new roles of CEO and CIO [19, 26], and the development of digital transformation strategies [8]. Digitalization and digital platforms act as processes or instruments that can lead to drastic changes of certain industry basic rules and conditions for organizing the production and capture of value [7, 12].

Digital transformation is closely linked with digital disruption, which is understood as lack of stability and turbulence in business environment caused by digital innovation that leads to the erosion of firm boundaries and previous basic rules for organizing the production and capture of value [7, 26]. Disruption is connected with business-model innovation that enables entrants to enter markets with cheap, easy to use, but low-performing products [16]. Digital disruption is much faster, global from the beginning and is connected with digital transformation. Digital disruption is created by digital disruptors that leverage digital technologies to undermine established models of consumption, competition and operations [3]. In spite of numerous researches of different aspects of digital transformation certain points are still very vague regarding dimensions and velocity of DT as

well to which companies and industries DT apply more as well regarding role of different factors in the success of DT.

First research question for this article is: How digital transformation affect big multinational companies and why do many failures happen with DT?

Second research question is: How management of established multinational companies is changing under pressure of digital transformation and to what extent the success of DT is connected with people?

III. RESEARCH MAIN PART

Methodology. During the study a complex of theoretical and empirical methods was used, mutually complementary, methods of a systematic approach, historical and retrospective, logical and structural analysis and synthesis, as well as general scientific research methods, methods of economic, statistical and comparative analysis, collection methods, were applied. The study combined desk research (collection and analysis of information from domestic and foreign sources, including print media and web data) and field research (information obtained during the interviews).

Research procedure. The study involved analysis of the previously obtained results by academics.

The author research design consisted of several steps: (1) developing the dimensions of study through a literature review; (2) an online survey of 78 individuals, industry experts from leading Russian firms; and (3) the data analysis on basis of obtained statistics.

Main results were obtained through literature analysis, best practice examples, interviews and focus groups. In the literature review, were analyzed 30 academic publications on digital business transformation. In addition, we conducted exploratory interviews with decision makers and digital transformation leaders from Moscow.

IV. RESEARCH RESULTS

Digital technologies have changed both central targets of any company: customers and the markets.

The changes of customers are bringing a radical transformation in sales and marketing functions. Consumers have changed their lifestyles and improved their information about products and markets situations. Markets have also radically changed. Current process of value creation in many industries is changing and becoming more and more connected with key IT technologies—mobility, cloud computing, business intelligence and social media. There are deep changes of the business environment connected with technology and globalization.

Technologic changes permitted to lower transaction costs, have already transformed customers and markets both in developed and developing economies.

Many sectors of economy including technology, telecommunications, finances are in process of digital transformation. Business models are influenced by twin forces of information technology and globalization. Many firms have met new competitive challenge of aggressive technology firms from emerging countries, especially from China. The biggest emerging markets of China and India have big potential but are rather complicated and specific.

The market has become fast, convenient and simple which is what customers want. Mobile phones transactions have become a popular trend because of the convenience. With new digital technologies such as Blockchain, transaction speed can be enhanced dramatically, reaching more people with radically reduced costs and faster turnaround. Technology is becoming now a driver of revenue and enabler of new business models. For example, if the smartphone revolution hadn't happened, numerous aspects of culture, politics and the economy would look wildly different than they do today. The emergence of new cloud-based businesses is connected with use of mobile phones to reach new clients, a lot of fast-growing companies grew on basis of geolocation. Famous new digital TNCs Uber and AirBnb are based on digital platforms. There is a lot of fast evolving technologies. Incumbent established firms take active measure to adopt to DT, but in spite of spent money and efforts many times fail. An average about 4 of today's top 10 companies in each industry by market share will be displaced by digital disruptors in the next five years. Customer and market changes are connected with increased speed of innovation and more data is moving. 93% of the world's stock of data was generated in the past two years. 99% of that is now digitized. There is a growing speed of arrival of innovations to the customers. After the introduction of the mobile phone it took 12 years to reach 50 million users. The internet only needed 7 years to reach the same point. Facebook had 50 million users in 3 years and WeChat had achieved that in a year. Famous Augmented Reality game, Pokémon GO only took 19 days to get to that number.

The post-digital markets are where products, services, and even the environment are customized on basis of digital technologies. The world is becoming more involved in hyper-personalization and on-demand digital services. Companies are developing close collaboration with customers based on personalization. 33% of global firms have accelerated their progress creating new sales channels via social media and other digital tools incorporated in the company's digital platform. Simplicity and real-time hyper individualized services are what customers love about businesses undergoing digital transformation. For example, Adidas recently introduced a smart ball. An integrated sensor captures data and provides feedback on shot strength, trajectory, and spin or speed via an accompanying app. This can lead to tips for improving technique and skills. Customers can log their statistics, track their improvements and share their success with friends [3]. Nike is doing something similar with Nike+. Running shoes equipped with sensors collect data and synch with the web. The online platform provides analysis of tracks and times, customized training programs and social networking. Athletes receive feedback on their progress and can connect with friends, other athletes and coaches [3]. At the same time, Nike collects useful marketing data: when users run, how often they run, how long they are running and what music they listen to [6]. Gillette with 3D printing startup Formlabs offer made-to-order razors created by customers through the website. Sam's club has developed an application, which combines machine learning and purchase history to automatically create grocery lists for customers and will soon give them the ideal shopping route.

Disruptive technologies, like the Internet, have already profoundly changed the surrounding world and our daily lives.

The important feature of current business environment is the digital disruption, which means a transformation caused by emerging digital technologies to business models. It impacts the value of existing products and services as well mode of consumption. While digital technology is disrupting market dynamics, it also has the solution for firms that need to operate at high speed. Digital disruptors create value for customers offering the customer a lower cost or other economic gains, a superior experience and creating network effects.

The most famous digital disruptors – Amazon, Google, Uber and others – do not focus on just one type of value, but use combinatorial disruption, where the three values are mutually reinforcing. Digital disruption comes to big extent from startups, like Uber, Skype, iZettle, and Spotify. However, there are also plenty of examples of incumbents pursuing digitally disruptive strategies, like GE, Disney, Nike, and BBVA Netflix or Tencent or Facebook or Axel Springer. One more example, is an attempt of Starbucks to combine its superior customers experience with digital technologies. Starbucks is trying now to provide platform value with its own pre-pay mobile application, which has \$1.4 billion of coffee drinkers' cash earning.

Digital disruptors influence the value creation in two ways:

First type of digital disruptors, for example Amazon, Uber, Airbnb by their competitive advantage shrink the overall market size, leading to lower revenue and margins, or both. Their disruption model is based on extreme low-cost value.

Another type of digital disruptors creates digital market opportunity in existing markets in a digital enhancement (e.g., adding a sensor to a product) or in entirely new markets. Among such disruptors is Chinese social media WeChat with their new financial service Weilidai. German leading firms such as Siemens, BASF, Bosch, Daimler, Deutsche Telekom, Klöckner&Co. are good examples of established firms fighting with digital disruption in concept of Industry 4.0, when product design and development take place in simulated laboratories and utilize digital fabrication models. The products themselves take tangible form only after most of the design and engineering problems have been worked out digitally.

Important side of digital disruption is the growing importance and wide spread of online platforms. Digital business is run on basis of platforms, which serve as a nexus of exchange and interoperable technology that allows a wide range of vendors and customers to seamlessly interact. First movers on Industry 4.0 are seeking a platform advantage. GE and Siemens are trying to improve their strategic position as platform providers. Each company has developed a cloud-based system for connecting machines, devices, and systems from a variety of companies — facilitating transactions, operations, and logistics seamlessly among them, and collecting and analyzing data for use by all.

In today's world there are certain digital technologies that will have a disruptive transforming impact on management of firms of many sectors.

The most disruptive emerging technologies which will influence many sectors of the economy are:

- Self-driving cars.

- Genetic Engineering.
- Distributed ledger technology (blockchain as part of it).
- Big Data Analytics.
- 3D printing.
- Immersive Technologies and Virtual Reality.
- Robots.
- Quantum Computers.

IoT (Internet of Things), Artificial Intelligence, and automation allow business data to be analyzed immediately. Artificial Intelligence can not only analyze data as well provide quick, instant responses to customers, and even automate administrative tasks. They create a substantial difference in the marketing strategy and can process data far more efficiently than before.

Digital tools give way to accelerated product development and better customer interaction through Web&mobile channels. 25% of the world's largest firms actually use business analytic technologies with conversational user interfaces. In the nearest future about 20% of firms will use Artificial Intelligence to give real-time directions for lower level managers. 30% of American Firms use now digital secretaries, and for example Alexa for Business costs only \$7 per month, per device, while the average monthly salary for administrative assistants in the US is \$3000.

Among the most influencing Management new digital technologies are Artificial Intellect and Cognitive Computing. Deep Learning is letting computers analyze unstructured images and audio and extract detailed information about their contents. IBM's Watson is the most advanced and powerful and was used in 2018 by 17000 companies worldwide in different business fields, especially for business analytics and predicting.

One of the digital technologies changing managerial daily routine job are Voice-enabled tools— including Personal Digital Assistants (DAs) like Cortana. These AI solutions that can interact with their users, learn their behavior and understand their needs, and even make decisions on their behalf. Today's prototypes include Amazon's Alexa, Microsoft's Cortana, Google Now and Google Home, and Apple's Siri. It's projected that 80% of brands will use chatbots for customer interactions by 2020. Now the most advanced DA is Microsoft Cortana application. According made research 40% of respondents under 35 say "I'll expect every company with an app to have a voice skill" require a human. Automatic buying, like Amazon Fresh, is already here.

The companies leading the artificial intelligence research are Google, IBM and Microsoft. Artificial Intelligence may threaten parts of the human workforce, but it makes the managerial and business processes easier and faster. It can provide larger amounts of accurate information that are necessary to improve decision-making for all levels of managers.

Traditional decision-making is too slow for the realities of the new digital market. But most knowledge management and reporting systems are not able to support high-speed decision

making, only next generation of decision supporting applications based on AI can improve the situation.

There are certain management challenges and problems connected with digital transformation. The recent Gartner Survey of CEOs found that 47% of CEOs are being challenged by the board of directors to make progress in digital business. 20% of CEOs report they are now taking a "digital-first" approach to business change and 56% said that their digital improvements have already increased profits. Firms reorganize to fully embrace the digital changes, but challenges are big. 70% of all digital initiatives don't reach their goals. From the total amount of \$1.3 trillion spend on DT in 2018, \$900 billion went to waste. Why do some firms have success in digital turnaround but majority fail? It's mainly because from managerial side to make digital transformation of business is a rather complicated process connected with people, skills, company organizational culture and remaking of all business process.

The main obstacles to digital transformation of established firms are:

- Lack of necessary visionary/innovative skills within firm to define the right digital strategy
- Difficulty finding proper high-tech skills
- Escalating costs of DT
- Lack of willingness to cannibalize existing revenue volumes and business models
- Lack of trust that potential benefits of DT can be achieved in real life.

Digital global market allows firms to become quickly global players. Because of their size, multinational firms are adapting to market change not so fast. The challenge for today's large multinationals is to create an organization that maintains the advantages of size while remaining agile enough to stay ahead of competitors. Globally integrated enterprise is a solution. Previous research indicated that two digital strategies--customer engagement and digitized solutions--provide direction for a digital transformation. Two technology-enabled assets are essential for executing those strategies: an operational backbone and a digital services platform [2]. Digital tools push to concentrate and centralize certain functions, for example IT, but generally network approach with maximum flexibility in managing semi-independent branches and companies is the imperative. Digital tools facilitate coordination and give revival to matrix structures on new level of execution towards more flexible networked team-centric structures. Networks of Teams" are characterized by their ability to self-organize, widely distribute decision-making and quickly adapt to market changes. For a company to stay agile, teams must be formed and disbanded quickly. Examples of such companies are Apple, Google, Amazon, IBM and other high-tech companies. Companies should be agile, all business activities, from product development to customer response need much faster decision-making and activities based on deep business intelligence and forecast.

Human side of digital transformation is the most complicated one because it involves different generations of

workforce, each having their own understanding attitude towards Digital Disruption.

Digitalization needs new skills but at the same time means downsizing. People are afraid of massive layoffs, for example according estimates by 2035 all jobs in manufacturing can be executed by robots guided by AI. Digital turnaround takes place when new generations of workers are entering the stage. Millennials (born roughly between the years 1980 and 2000) and Generation Z bring their own values, skills and mindsets to the leadership mix.

Millennials and Generation Z have come of age in the digital era and don't respond well to classic, top-down corporate hierarchies. Instead, they value a more collaborative approach, organic, bottom-up organization. They are motivated by ambitious projects and have a natural affinity for mobile-first and cloud-based collaboration tools, which means this generation can be useful in testing and maximizing the utility of these tools.

Acquisition and development of the right talents and highly skilled workforce via digital tools has become a routine. Standard procedure for all biggest companies is to study applications online. Even jobseekers interviewing many times take place online.

For companies that have prospered within the digital world, 71% have attracted new workers and skills through digital innovation. Job-matching sites such as LinkedIn and Monster allow the change and expansion of the individual's perspectives in process of a job search. Employment and hiring may have become unconventional because of this technological breakthrough, but they are also faster and better.

These digital talent platforms deliver transparency and efficiency within the labor market. Surveys reveal how working from home is increasingly possible with flexible hours. Technology creates opportunities for stay-at-home mothers and students to work for even just a few hours in a week. In digital era the traditional year-end performance review is becoming not efficient for many companies. General Electric tried to use new digital HR tool FastWorks, but failed, because people found uncomfortable to provide the feedback in real-time and felt no clear incentive to do so.

New leaders should respond to digital disruption, basing on new essential competencies, new work experience and background

In digital age the style of management is changing, it is becoming more open and participative. Earlier leaders obtained maximum technical expertise. Today staff often have deeper subject knowledge than their boss. Earlier a major part of the leader's job was to mentor junior colleagues, now younger employees advise senior executives on current trends and technology. Earlier the leader was concentrating, holding the power in the firm. Digital times demand leaders to empower others. Firms have also shifted from having teams collaborating face to face to working in virtual teams.

For success in the digital age new successful digital leaders tend to have eclectic backgrounds. Not all of CEOs are technology experts. At the same time earlier financial background, typical for majority of CEO during last 20 years is not obligatory. CEOs of incumbent established companies need a visionary talent for shaping companies into future-

oriented, agile and ready for change firms. As shows the failure of GE in digital transformation, lack of vision and understanding of real processes can be fatal even for very big established multinational companies.

In new digital era the following personal qualities of CEOs are in demand: humble, adaptable, visionary, engaged and realistic.

Business analytics and market intelligence information are at the heart of CEO job. Business intelligence now underpins nearly every aspect of business operation, from supply chain and risk management to marketing and product development. To succeed on the digital playing field, where speed to market is critical, global companies must move closer to operating in real time. As such, the ability to analyze information rapidly to inform decision-making will be essential. Now CEOs need less time for control thanks to digital tools. Business intelligence helps to make strategic decisions and react in all aspects of operations—including reaching new customers, reducing costs and improving supply chain management, predicting future trends, identifying resource gaps and businesses problems under alternative market scenarios.

V. DISCUSSION

The biggest benefit of digital transformation is the growing market share thanks to innovation, improvement of customer relationships, smart hiring practices and growth of brands based on high speed and easy data flow within companies. Digitalization permits C-room to concentrate on increased Market Share as a Goal of Strategy.

Management Challenges of DT require deep changes in management practices and organizational structures. These changes include new forms of IT architecture and data management, close links of IT and business strategy and operations, new organizational structures, and a new digitally oriented culture. DT requires very high-profile leadership and stakes for efficient CEOs are extremely high. Three aspects of digitization are the main subjects of Strategic approach: full digitization of all company's operations, digital redesign of products and services; closer interaction with customers.

From strategic point of view Digital transformation will mean "No" to Conglomerates, "No" to much differentiation, "Yes" to Decentralization.

VI. CONCLUSION

Digital transformation facilitates such important sources of core competence as organizational learning, strategic flexibility, effective technology management thanks digital speed of data transfer, minimizing stock and working on demand. To succeed in DT firms' organizational structures should be reorganized from hierarchical decision-making and toward a network team based flexible agile structure. Essential competencies of new digital age CEO are informed decision making, fast execution, hyper-awareness, advanced knowledge of digital tools.

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