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Disruptive Business Model Innovation and Digital Transformation

Katarina Tomičić-Pupek, Martina Tomičić Furjan, Igor Pihir, Neven Vrček
University of Zagreb, Faculty of Organization and Informatics, Varaždin, Croatia

Abstract

Background: Innovating how organisations run their business is a strategic decision to create more value for customers using or consuming the product and/or service provided. In addition to the incentive of everybody embracing digital transformation, digital technologies, and digital innovation, which frame changes of operating business models today, disruptions, i.e., another incentive that occurs suddenly and impacts globally, all force businesses to adapt and change. **Objectives:** This research aims to provide a conceptual model that can be used for organisations to evaluate and propose feasible options for responding to disruptions that influence the businesses' strategic innovation initiatives while assisting decision-makers in choosing the most appropriate option. **Methods/Approach:** Considering internal and external factors that influence digital transformation, the conceptual framework is designed to assess readiness and willingness to transform and create opportunities for future success digitally. **Results:** A conceptual framework was developed, tested, and demonstrated in a case study. The case study organisation rated positively the composition of steps to be perf readiness and willingness and choose the most feasible option to change. **Conclusions:** The digital environment and the influence of disruptions force organisations to change. The conceptual framework developed in this research helps the management choose the most feasible change option about the real as-is and the desired to-be state.

Keywords: Digital Transformation, Business model innovation, Disruption, Framework, Assessment, Case study

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Introduction

The complexity of organisations and their environment is rapidly increasing, creating constant innovative change in business activities, resulting in products and services aligned with the new customer and stakeholder's needs. Digital, Business Model, Digital Business Model, Digital Technology, Digital Innovation, Digital Transformation, and Digital Entrepreneurship are seven terms identified within the literature as the ones affecting innovation and change the most (Bican & Brem, 2020).

Disruptions, as situations or events that cause an interruption of the usual flow of processes, have the potential to be the driving force of innovation and change, with consequences that are difficult to predict, as evident from the latest global Covid-19 pandemic and the way it has significantly changed the world.

Business models describe what benefits a company provides to customers and partners and how those benefits are transformed into revenue (Schallmo et al., 2017). They illustrate selected aspects of how the company transforms resources and builds relationships with other market participants (Becker et al., 2021). Often, business models are considered as one-page canvas-like blueprints describing (new) value propositions, as well as supportive and constructive elements contributing to delivering the designed value.

Business model canvas (Osterwalder et al., 2015), as the most used and cited business model framework, is divided into nine building blocks or elements, grouped into four sections: customer (relationships with customers, customer segments and channels), organisation (key partners, activities, and resources), value (innovations of services or product through possibilities new technologies provide) and finance (costs and revenue streams). Operationalization of the business model canvas (Osterwalder et al., 2015) and other canvas-like frameworks has been made in Business process modeling Billboard (vom Brocke et al., 2021).

Business model innovation comprises changing one or several business model elements or their interconnections (Foss & Saebi, 2017). It can be driven by the goal to adapt to a new customer need (customer-driven), by enhancement or use of new emerging technology or a mainstream technology in an evolutional manner (technology-driven), or the need or necessity to improve usual workflows and structures which support the workflows (organisational development driven) (Hrustek et al., 2019).

The global COVID-19 pandemic has revealed a new driver of change, namely a disruption (Kutnjak, 2021), which can appear suddenly, can have a disruption or great impact on the way business is done, which affects an organisation in a vortex (Loucks et al., 2016) similar behaviour within an industry and seeks for the fast or agile response. Disruptions can cause supply uncertainties and pose risks for input resource shortage, delays, overstocking, and negative financial results (Chen & Liu, 2021). Crises often create space for new business models that "encompass new capabilities, new value propositions, and new value demonstrations, and address new customer needs" (Ritter & Pedersen, 2020, p. 216). In the past, many disruptions have affected businesses and their usual business models (like the financial crisis 2008) and caused massive responses in the industry or industries affected. Still, they didn't have such a global effect as the latest health-related one. In addition, d, as a radical change and innovation opportunity raised from digitally enabled channels, digital transformation ned possibilities beyond what was considered possible or feasible (Brown, 2019). Hence, the newest crisis requires a global and faster adjustment.

Digital transformation is a concept that has marked the innovation process in the last 5-7 years (Pihir et al., 2018) significantly since it experienced rapid enrichment through new approaches, frameworks, and methods. Digital technologies have a

great impact on organisational strategic goals achievement. Service providers of information and communication technologies have to "focus on business model experimentation" to harmonise "their organisation's strategies with disruptive and/or innovative digital transformation" (Clohessy et al., 2017). Successful digital transformation has proven elusive despite all efforts, as only one in six organisations sees the expected results (Gale & Aarons, 2018). Meanwhile, according to a survey by Gale and Aarons on a sample of 135 managers in US Fortune-level organisations, over 88 percent of companies have major initiatives to become digitally transformed in the next three years (Gale & Aarons, 2017).

Motivated by the previously described context, this paper proposes a conceptual framework that can help organisations influenced by disruptions of any kind to identify their current position, their intentions, and capabilities to change, and after that, to direct the change efforts into the most suitable and promising mode of change towards digital transformation as a final desired state of operations.

To develop the conceptual framework, existing influence factors were gathered, classified into internal and external factors, revised in the context of disruptions and uncertainty, and then used to design a balanced assessment instrument for assisting organisations in assessing their readiness and willingness to transform, position themselves in the operating ecosystems and decide on feasible response options. This balanced exploration of readiness and willingness concerning exploitation opportunities represents an addition to existing frameworks and models, which mainly cover some of those elements separately.

The structure of the paper is as follows. After the introduction, methods, research design, and theoretical background are presented. The next section brings the resulting conceptual framework proposition. After the proposed conceptual framework, empirical research was conducted on a demonstrative case study. The next chapters present an evaluation of the case study, discussion, and implications. The paper concludes by summarising the main results, limitations, and further research possibilities.

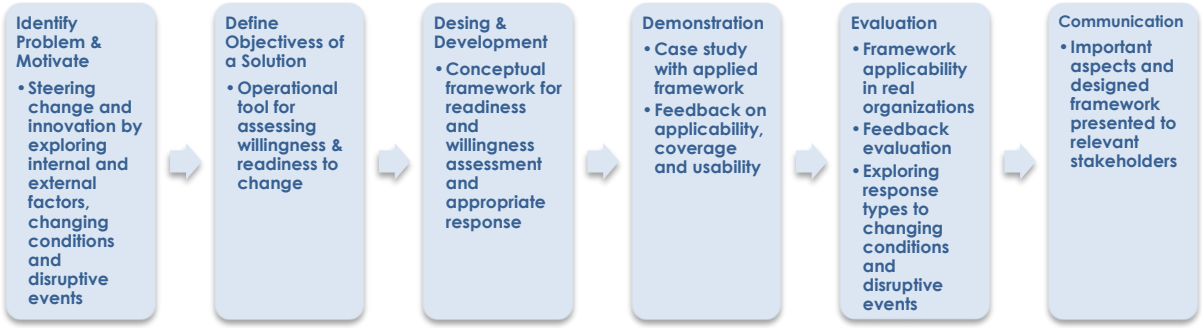
Methodology

This research is based on a problem-solving approach using the Design Science Research (DSR) methodology. Following vom Brocke et al. (2020), the research design was performed through six activities: 1) Problem identification and motivation, 2) Objectives Definition, 3) Design and development of a framework, 4) Demonstration through a case study, 5) Evaluation of the framework based on case study and feedback, and 6) Communication to relevant stakeholders, i.e., researchers and professionals.

The paper is structured by following this methodology. First, the problem and motivation are presented in the introduction section. This second section briefly explains methods and research design, stating the research objective. The following sections present the design and development of the research through the background of the research topic and the conceptual framework proposition. Next, the paper demonstrates the application in a real case study, its evaluation, discussion, implications, limitations and further research, and conclusions, which are given at the end.

The applied DSR Methodology Process Model is depicted in Figure 1.

Figure 1
DSR Methodology Process Model (vom Brocke et al., 2020)



Source: Author's illustration

This research proposes a conceptual framework that aims to contribute to a body of knowledge and arrange concepts and constructs for assessing readiness and willingness to respond to changing conditions in the operating environment and disruptive events. Since this research relies on a longitudinal literature review and experience gathered in over a decade-long project activity of authors, it is somewhat subjective. However, the intention to publish a paper in this early stage is an important step for future research since, according to (Gale & Aarons, 2017), most US Fortune-level companies plan digital transformation in the following years, which will surely motivate others within the same or within accompanying industries, to follow. According to existing literature and team research experience in digital transformation, ICT-enabled process improvement projects, business process management, and organisational change initiatives, the authors propose a conceptual framework for achieving the objective of this paper. This conceptual framework will help organisations guide their change after a disruptive event and decide which feasible direction to go. Based on earlier referenced methods, a conceptual framework will be further researched in real case study examples and examined in more detail. A conceptual framework is proposed for the CEO (Chief Executive Officer) and strategic management level supported by the CIO (Chief Information Officer) and/or CTO (Chief Technology Officer) and/or CDO (Chief Digital Officer) if delegated.

The authors intend to gather relevant opinions and develop an elaborate research design. Since this paper demonstrates one case study, future research will be performed in more detail on several case studies for further evaluation.

For this first evaluation of the framework, the interpretive stance (Conboy et al., 2012); (Goldkuhl, 2012) is applied and will be followed by conducting an exploratory field study with selected organisations (Miles et al., 2014; Walsham, 1995; Yin, 2017; Rashid et al., 2019). A semi-structured interview using a data collection instrument (based on Tables 1-3) has been conducted to demonstrate and evaluate the framework.

Our further approach will be based on grounded theory methodology (Glaser & Strauss, 1998; Mason, 2006; Urquhart, 2013). Therefore, we build up our constructs and elaborate interview questions. In the end, we apply a grounded theory coding approach to fully describe the conceptual framework after more case studies have been performed.

Theoretical Background

Based on the literature review, presented in the following parts of the paper, a baseline of impact factors is gathered and presented as internal and external factors influencing digital transformation as a most demanding organisational change in the recent digital age.

Internal Factors Influencing Digital Transformation

This study comprises 6 Digital Transformation initiatives within Croatia gained by various internal factors that influence organisations' digital transformation. A positive fact is that internal factors can be influenced, controlled, and governed. Traditional internal factors influencing and shaping organisational capabilities can be (conservatively) seen as "Mission, Vision, and Goals; Strategy; Technology; Size; Life Cycle of the organisation; People; Products and Location" (Sikavica, 2011, p. 216). A more contemporary view on those traditional internal factors, identified by analysing scopes, methodologies, and readiness assessment tools in the literature describing maturity frameworks, considers them as pillars, i.e., building blocks for whatever an organisation can generate, products, services, or general value for customers.

According to (Pihir et al., 2019), Digital Transformation Pillars are a) Strategy orientation; b) Customer centricity; c) ICT and process infrastructure; d) Talent, capability, and capacity strengthening, and e) Innovation culture and organisational commitment. In light of Digital Transformation, they could be seen as agility characteristics because Digital Transformation Pillars help boost digital transformation and support successful Business Change. These pillars (Pihir et al., 2018) were identified on an extensive evaluation of several digital maturity models assessing digital transformation and digital maturity. The pillars comply with the existing wide range of global and regional methodologies through some of the matches within three key elements from Digital Maturity Model - TM Forum (TM forum, 2020), four dimensions of the Digital Maturity Model 5.0 – Forrester (Forrester, 2018); Digital Maturity Assessment Tool - Government of South Australia (Government of South Australia, 2022); Key pillars of digital transformation - Chief information Officer (CIO) Report (Evans, 2017) and five areas of the Framework for digital maturity of schools – CARNet (e-Schools, 2018).

Pillars of digital transformation from (Pihir et al., 2018) should be seen as internal factors of an organisation's maturity for digital transformation:

Strategy orientation refers to an organisation's vision, which needs to be oriented on value propositions, streams, and chains. The role of the management is to design, model, lead, and direct all the efforts in achieving the vision in long and short terms, as well as constructing and deconstructing appropriate internal environment devoted to accomplishing goals.

Customer centricity is a digital transformation keystone in the focus on customers. Understanding the pains and gains of customers, predicting and shaping expectations, managing customer journeys, rethinking the value propositions, and establishing customer communities that will advocate, recommend, and communicate the market value. Knowledge engineering and creative design thinking methods and techniques application should be oriented on empathy mapping to harvest benefits from targeting relevant stakeholders (Pileggi, 2021).

ICT and process infrastructure refers to the infrastructural resources, including technology, data, and business processes, that must be aligned with the strategy orientation and customer-centricity. The infrastructure is only potential until it is put into use. It can be seen as a prerequisite for agility in coping with external environmental challenges. Still, it can help deliver results only as good as governed and streamlined with the organisational or business objectives.

Talent, capability, and capacity strengthening include talents, skills, capability, and capacities to build new knowledge and know-how that become essential due to the development of technology-intensive societies. Rapid technology growth fundamentally redefines how an organisation needs to keep its competitiveness and generate contemporary competencies to pursue new endeavours. These resources determine the extent of exploitation and exploration opportunities concerning industry, environment, customers, and other factors.

Innovation culture and organisational commitment enable exploitation when the maturity of current assets is at a stage where the acceptable return is profitable, with or without minor innovation. Exploration is more resource-intensive and demands more creativity, innovation potential, and commitment to building a playground (Tomičić Furjan et al., 2019) for testing the feasibility of ideas, ventures, or value propositions. The role of organisational culture is to provide a motivating environment for supporting the atmosphere where trial and error are welcome, building the potential to become innovative and gaining agility for responding to new disruptions.

The expectation that most organisations face nowadays is that they need to be agile. In this case, agility refers to being ready to respond to disruptions and challenges with high adaptability, flexibility, evolutivity, and innovation. Here, it is important to emphasise that agility is very much dependent on the industry the organisation is operating in. Some industries are more technology-intensive than others, and even in the same industries, the same technologies can have different significance in the level they are implemented in business processes. The maturity of technologies within industries is therefore not necessarily similar by its potential to contribute to the value of products or services; some technologies can already be considered mainstream in some cases (like robotics in automotive industries), while they could have emerging importance in others (like Artificial intelligence in education). Nevertheless, the internal influence factors are only as valid as the environment of an organisation is ready to perceive its ability to deliver the value proposed.

External Factors Influencing Digital Transformation

Various external factors influence the digital transformation of organisations. The most important are technological changes, competitive pressure, ecosystem dynamics, regulatory framework, and innovation infrastructure.

Technological changes have a significant impact on socio-economic trends and how organisations work. A well-known relationship between technology and economic activity is given by the Kondratieff cycles (K cycles) (Kondratieff, 2015). Today, we have many research papers on technological change and the response to economic activity. It is generally accepted that the fast adoption of new or disruptive technology can give a significant market advantage. However, many authors also warn that there are obstacles related to technology adoption (Oliveira & Martins, 2011), such as the organisation's maturity level, the agility of business processes, risks associated with technology adoption, etc. This means that besides awareness of technology change, organisations must continuously increase their capacities for technology adoption and change management (Ritchie & Brindley, 2005).

Competitive pressure is an essential part of market relationships. Competitive advantage has many components. Companies compete in business models, organisation of business processes, technology use and adoption, etc. Competitive pressure pushes organisations to take risks, embrace changes and stretch their limits. Generally accepted variables of competitive pressure are market share, time to market, quality of product or service, flexibility and adaptation to customer needs,

and cost efficiency. Companies face increasing market concentration, with considerable productivity and profitability gaps between the top companies in each sector and all others. Every organisation must constantly evaluate its market position and find new ways to adapt (Thong & Yap, 1995). In that respect, companies adopt dual strategies, which allow them to excel in traditional business while embracing new and unexplored business models.

Ecosystem dynamics and ecosystems gained popularity with the smart industry and digital platforms paradigms (Immonen et al., 2014; Makris et al., 2018). Many smart products are supported by large ecosystems, such as mobile phones, smart cars, gaming consoles, etc. (Makris et al., 2018).

A business ecosystem is a dynamic group of largely independent economic players that create products or services that together constitute a coherent solution (Pidun et al., 2019), meaning that it is a governance model that is complementary to other ways of organising the creation of a product or service, such as a vertically integrated organisation, a hierarchical supply chain, or an open-market model. Each ecosystem can be characterised by a specific shared interest (delivery of better product or service) and a particular number, although rapidly changing, group of participants with different roles (such as producer, supplier, orchestrator, complement). This organisational structure can quickly provide access to technologies and knowledge that may be too expensive or time-consuming to build within a firm. Once launched, ecosystems can scale much faster than individual businesses because their modular structure makes it easy to add partners. In a sense, they are designed to scale up with very low risk involved for participants. Ecosystems are flexible and resilient; their modularity enables many participants and a high capacity to evolve. Ecosystems also have their downsides, and many fail (Pidun et al., 2020), but still, they are an unavoidable form of a modern business environment.

The regulatory framework might be vital for the large-scale adoption of certain technologies (EU SCAR AKIS, 2019). These are mainly technologies that interfere with some older technologies that are partly regulated (such as electronic invoices or cryptocurrencies) or introduce market changes that are considered dubious or unfair (such as the Uber business model or the use of Artificial Intelligence in certain cases). In that sense, regulators play an important role in implementing and using certain technologies. The regulatory framework can make a significant difference in the overall economy of the country and the rise of its business activity. Of course, many technologies are neutral to the regulatory framework, and companies seek a stable and lightweight regulatory framework.

Innovation infrastructure has many forms, but most notably, it is present in government-sponsored innovation hubs and governmental incentives for innovative products and services (OECD, 2019). These incentives are essential for reducing the risk related to adopting new technologies and giving access to knowledge and technologies beyond the capabilities of many firms. Nations worldwide invest public resources in research activities by universities, research institutes, and companies. Public resources are essential to generate new knowledge and reduce private research risks. Such an approach is extremely important for SMEs striving in daily operations without the capacity for research and development. However, they can develop skills through different educational programs, innovation hubs, competence centres, and vocational training activities. Innovation hubs serve as a one-stop-shop where firms, particularly SMEs, can access services related to testing, attracting investors, skills and training, networking, and the innovation ecosystem. Another initiative striving to increase innovation potential is related to producing and using open data, which can create new opportunities for companies to learn from other's

work efforts (Corrales-Garay et al., 2020). Also, developing data lakes and working towards creating and implementing open data strategies for producing or using other company's data can lead to de-silofication in organisations, as shown through multiple case study analyses (Enders et al., 2020). The willingness to pay for other companies and public sector data to create a test polygon for new ideas and innovations has been identified (Enriquez-Reyes et al., 2021). One of these incentives' most important side effects is the development of an experimentation culture necessary for the modern business environment. Low-risk experimentation is crucial for initiatives based on new technology implementation. In that respect, the business community needs a playground for testing the feasibility of ideas. As support for developing a digital transformation playground within an organisation, demonstrative operational methodologies can be applied (Tomičić Furjan et al., 2019).

Conceptual Framework Proposition

While operating with internal capabilities for agility and under various external factors in a changing environment, organisations must continuously re-evaluate their position and need for a response. Five distinct environments (classical, adaptive, visionary, shaping, and renewal) according to three dimensions of the business environment (predictability, malleability, and harshness) can help choose a general strategy archetype for response (Reeves & Haanaes, 2015). At the same time, the strategic response needs to be incorporated into the business model, which, as a framing concept, needs to be translated into operational business processes. With the exponential technology growth, disruptive events, industry-specific competitiveness, and increasing customer centricity, the borders of appropriate distinct responses are blurring. Rethinking relationships within ecosystems and across value chains call for diversity in managing the change, resulting in strategic and BPM ambidexterity (vom Brocke & Mendling, 2018), dual strategies, digital twinning, everything-as-a-Service, everything-as-a-Platform, and similar business paradigms.

Yet for some organisations, industries, and even some economies, no response is a feasible option, meaning that not all organisations, industries, or economies feel the same competitive pressure to change their business models and digitally transform. Digital Transformation case studies can be found in (Tomičić Furjan et al., 2020).

Sometimes, doing nothing or continuing business as usual is a proper response. In this case, the business model stays the same; only operational processes can undergo minor adjustments to changing environments (e.g., during the global health disruption, bakery employees needed to wear facial masks while baking products in a small bakery or while selling bread, while everything else stays the same, would be seen as the continuation of operating within a same business model). Change is unavoidable for all others for whom continuation is not their operating reality.

The questions which arise in the case of inevitable change are the following:

1) To what extent is my organisation ready to change? The answer to this question can be found in many maturity assessment frameworks that evaluate maturity in various dimensions, thereby, the readiness to change. A variety of self-assessment tools helps organisations identify what they can achieve, describing the As-Is state. Still, it does not help in sketching the future. This describes the readiness of an organisation to perform some change.
2) What are we trying to achieve? The focus of change can be put on defining new value propositions, redefining process outcome priorities, developing improved customer journeys, designing new services or products, rethinking operating models, constructing or deconstructing value chains, implementing digital

technologies, boosting resilience, joining or creating ecosystems and other types of change. The only restriction should be put on the feasibility of change, meaning that the change should shape the desired To-Be state in an inspiring manner, but at the same, be feasible to achieve and not put the organisation in front of a chasing-a-unicorn-quest, which obviously cannot be realised for whatever reasons. This describes the willingness to initiate the change.

Previously described internal and external influence factors might be a starting point for positioning an organisation's readiness and willingness when faced with the need to respond. Positioning is intentionally used instead of evaluating because evaluations are often seen as a structured, systematic measurement or determination, whic requiringous instruments and criteria. On the other hand, positioning should encourage organisations to frequently perform rethinking-sprints and not obey only continuous indicator measurement loops.

As a visualisation of conceptual framework application, Figure 2 shows the general process flow, how to use it, and references instruments for steps performance.

Figure 2
Visualisation of Conceptual Framework Application

Source: Author's illustration

Step 1 - Internal and External Factors Assessment

In Table 1, the internal influence factors are gathered. In Table 2, external factors are listed, forming an instrument to assess the position regarding the two questions of what an organisation can do and what the organisation can achieve.

Based on the positions identified on a simplified scale of poor-medium-high, organisations can build awareness of the smallest and largest gaps and select a feasible option of change based on that.

Table 2 is a component of an assessment instrument aiming to help an organisation understand its readiness and willingness to adapt to external changes in the business environment. Each row refers to a different external influence factor, and the corresponding questions prompt introspection about the organisation's current state and desired future. The organisation can then rate its readiness for change and desired achievement level using a three-point scale (poor, medium, high).

For example, Change of Technology (EXT1) refers to how ready the organisation is to adapt to new technologies. The questions focus on the degree of exposure to technological changes, potential disruptors, and the organisation's capacity to incorporate new technologies into daily operations.

In addition to the continue as is option, four distinct options of change (shown in Fig. 3) arise, which can be selected based on the gap analysis from Tables 1 and 2.

Table 1
Readiness and Willingness Assessment Instrument - Internal Factors

Internal influence factors	To what extent is my organisation ready to change?			What are we trying to achieve? Enter the description in the selected row…
INT1: Strategy orientation	Do we have a clear vision of the value propositions, streams, and chains? Do we have stakeholder support?			poor medium high
	poor	medium	high	
INT2: Customer centricity	Do we properly manage customer journeys and experiences? Do we apply creative techniques to design new types of customer relationships? How strong is our customer community? Do we have tools for modelling and managing customer expectations?			poor medium high
	poor	medium	high	
INT3: ICT and process infrastructure	IS our BPM governance aligned with our strategy focus? Is there some technology that could act as a toxic legacy? How strongly do we manage our data?			poor medium high
	poor	medium	high	
INT4: Talent, capability and capacity strengthening	Do our resources fit more an exploitation or exploration approach? To what extent is our operating industry technology-intensive? Are the skills needed transferable, rare, or unique?			poor medium high
	poor	medium	high	
INT5: Innovation culture and organisational commitment	Does our culture offer a playground for testing the feasibility of ideas? Are we committed to innovation and agility?			poor medium high
	poor	medium	high	

Source: Authors

Table 2
Readiness and Willingness Assessment Instrument - External Factors

External influence factors	To what extent is my organisation ready to change?	What are we trying to achieve? *Enter the description in the selected row…*
EXT1: change of technology	Is my current operating industry highly exposed to technology change? Are there emerging technologies that might disrupt my industry? Do I have the capacity to introduce new technologies in daily operations? poor | medium | high	poor medium high
EXT2: competitive pressure	Do we have a significant competitive advantage in the market? To what extent can we predict future competitive potential? poor | medium | high	poor medium high
EXT3: ecosystem dynamics	Is there an adequate ecosystem that we can participate in? Do we have ecosystem management capabilities and business processes? To what extent does the digital vortex influence my value chain? poor | medium | high	poor medium high
EXT4: regulatory framework	Is the regulatory framework relevant for using competitive technologies in my industry? Do we have a favourable regulatory framework? Are there any regulatory Initiatives we can join? poor | medium | high	poor medium high
EXT5: innovation infrastructure	Can we rely on the assistance of digital innovation hubs, competence centres, education programs, and vocational training? Do we have access to services related to testing, attracting investors, skills and training, networking, and the innovation ecosystem? Are we open to the experimentation culture? Do we have a business community acting as our playground for testing the feasibility of ideas? poor | medium | high	poor medium high

Source: Authors

Step 2 - Gap Identification & Context Analysis Rules Evaluation

After the first step of readiness and the willingness assessment, the gaps should be analysed by their value (poor-medium-high) and context. If most marks are set to poor in readiness and willingness, continuation without change is a feasible option.

If the willingness marks are high, but most readiness marks are poor across internal and external influence factors, then terminal change is more appropriate. This case can be interpreted as the following situation: the assessed organisation is operating in an industry where significant disruptions are happening, where the expectations of customers are growing increasingly, but at the same time, the organisation does not have appropriate knowledge or skills, neither the infrastructure, organisational culture or the assistance from external stakeholders to change. Terminating the current business model means cutting your losses and/or suspending your business activity. This is a feasible option when, e.g., no resources are available, during global disruptions and lockdowns when the industry maturity curve is declining or reaching the zero-demand point. The business model needs to be terminated because the business environment has changed so severely that operations are no longer feasible. This response type to changing conditions and disruptive events is a feasible option when an organisation has, to some extent, recognised the uncertainty level of a clear-enough future (Courtney et al., 1997), forecasting that the organisation will not be able to deliver expected value.

If the internal willingness marks are high, but most external factors are poor, temporal change could be an appropriate response. This option would be feasible for organisations operating in an industry with the most significant external factors. An example of this type of change can be found in the restaurant-service industry, where due to the health disruption of Covid-19, many organisations switched to delivery but are aiming to roll-back to location-based food service with the experience of going to a restaurant. Temporally changing the business model requires introducing new value propositions through new distribution channels that were not operational before or through technology-supported operations, switching to substitute resources, activities, or products/services for a certain period. The business model needs an exploitation change, which will occur for a certain period. After the period has surpassed, the change can be rolled back to the previous state, meaning trusted business ways. This response type is feasible when an organisation has recognised the uncertainty level of alternative futures (Courtney et al., 1997), opting for a few discrete possibilities manageable for a certain time to deliver the expected value. According to (Courtney et al., 1997), the most appropriate managerial implication would be to reserve the right to play.

If the readiness-willingness gap is 1 for most internal factors and not greater than 1 for some external factors, and the willingness marks are mostly high, the transitional change could be feasible. The transition timeout could allow the organisation to gain additional strengths and build its capacities for the desired transformational change. The duration of the transitional change can vary, depending on the factors that endanger the change. If the missing link is infrastructure, the transition phase can last shorter; if the largest gap is in talent, capability, and capacity, strengthening the duration of boosting this factor would take longer. This change option is often seen in dual-strategy approaches and technology-based industries. Transitional efforts to gain capabilities to reposition are applicable when the organisation is aware that new-normal and technology-driven paradigms are becoming essential but is not ready to lead yet.

Due to changing conditions related to customers, ecosystems dynamics, or regulatory initiatives related to the use of competitive technologies in the operating industry or environmental requirements, the business model needs substantial improvements. Still, the explorational capacities are not scaled enough. This change approach is intensive on resource allocation because improvements must be implemented. At the same time, the organisation can try to achieve internal

capabilities to transform in the future. Unlike the temporal change, the transitional approach does not aim to roll back but to prepare for future potential. Also, this response type is a feasible option when an organisation faces the uncertainty level of a range of futures (Courtney et al., 1997), offering a range of options in gaining capacities for future desired transformational change in delivering the expected value. Managerial implications for this response type would fit the Adapt to the future strategic posture, according to (Courtney et al., 1997), and it could lead to shaping the future at some further point.

If the gap between readiness and willingness is 0 or not greater than 1 and the most willingness marks are set high, the organisation is ready for the transformational change. In this case, the organisation has what it takes to transform and can set the aim of responding to changing conditions and disruptive events more comprehensively. Transform and leading on the change is feasible as a response in cases when an organisation is mature enough to make a breakthrough, when customer experience management is a priority of technology-supported improvement designs when the organisation is ready to reinvent its business model and inspire others in its ecosystem to realise the joint vision or when favourable regulatory frameworks and initiatives are in place which the organisation can join. This response type is a feasible option when an organisation faces the uncertainty level of true ambiguity (Courtney et al., 1997), opening the space of action for shaping the future strategic reply or leading the design of expected value and creating new scenarios of delivering it.

Step 3 - Readiness and Willingness Assessment Calculation

As an overview of a possible application of the proposed conceptual framework, step 3 allows for readiness and willingness assessment using Table 3 as a readiness and willingness assessment instrument. The rules presented in Table 3 summarise the most important rules that have arisen from the current research and will be revised in future research. The rules describe internal and external decision factors and can be answered as Yes (the rule applies) or No (the rule does not apply) questions.

Step 4 - Selecting the Options for Change

Decision factors and rules from Table 3 are intended to help organisations identify which type of change could be feasible. The rules describing the Gap factors are more general than the additional internal and external factors rules.

Depending on the real case elements describing the context of the operations, the most appropriate type of change is the one with the most Yes (Y) decisions. The list of rules is not finite. Therefore, specific rules can be added if conflict or inconclusive results are obtained using this framework.

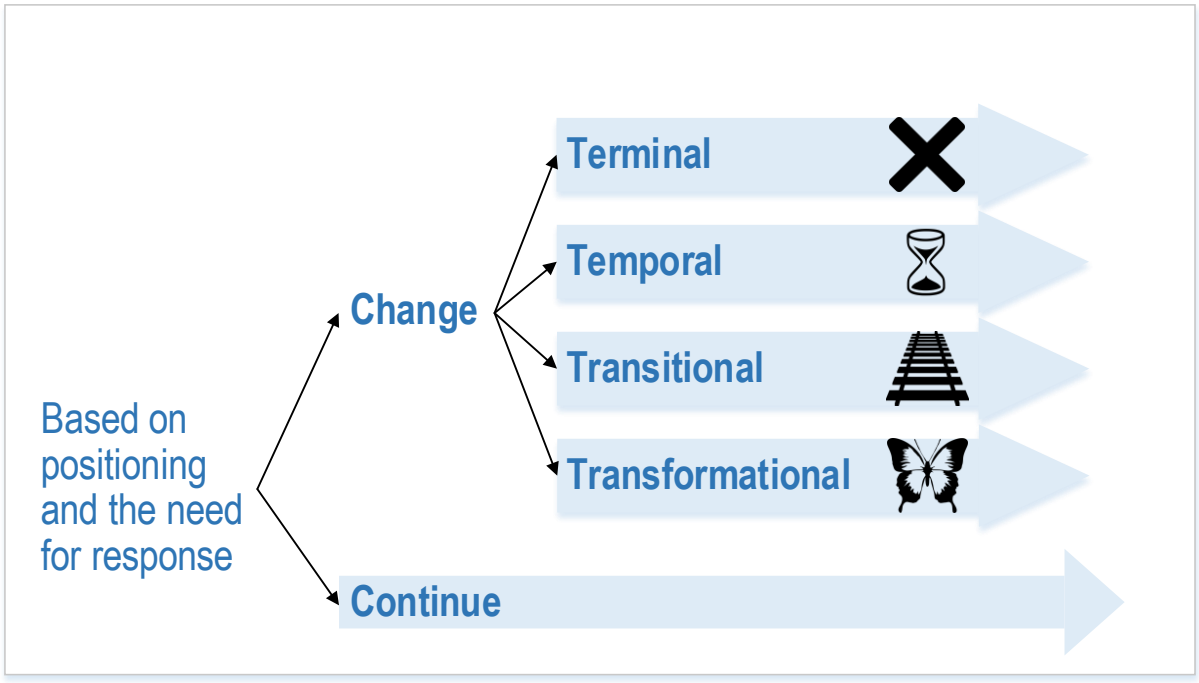
Figure 3 presents the response types to changing conditions and disruptive elements. The ultimate goal is to transform to thrive in the competitive environment, but this can be achieved in a one-step or more-than-one-step approach since there is no one-fits-all option for change.

Table 3
Readiness and Willingness Assessment Tables

	Decision factors	Rules	Change			
GAPS	Readiness/ willingness	Willingness marks are high, but most readiness marks are poor across internal and external influence factors	Y	N	N	N
		Internal willingness marks are high, but most external factors are poor	N	Y	N	N
		The readiness-willingness gap is 1 for most internal factors and not greater than 1 for some external factors, and the willingness marks are mostly high.	N	N	Y	N
		The gap between readiness and willingness is 0 or not greater than 1, and most willingness marks are set high.	N	N	N	Y
INTERNAL	INT1: Strategy orientation	The organisation is aware that the new normal is in place	N	N	Y	Y
		Mature enough to make a breakthrough	N	N	Y	Y
	INT2: Customer centricity	Customer experience management is a priority	N	N	N	Y
		Changing conditions related to customers	N	N	Y	N
	INT3: ICT and process infrastructure	Technology-driven paradigms are becoming essential	N	N	Y	N
		Technology-supported improvement designs are in place	N	N	N	Y
	INT4: Talent, capability, and capacity strengthening	No resources are available	Y	N	N	N
		Substitute resources available	N	Y	N	N
	INT5: Innovation culture and organisational commitment	Explorational capacities are not scaled enough	N	N	Y	N
		Reinvent its business model.	N	N	N	Y
EXTERNAL	EXT1: Change in technology	The industry maturity curve is declining or reaching the zero-demand point	Y	N	N	N
		Technology-supported operations available	N	Y	N	N
	EXT2: Competitive pressure	The business model needs substantial improvements	N	N	Y	N
		The business environment has changed so severely that operations are no longer feasible	Y	N	N	N
		Global disruptions and lockdowns	Y	N	N	N
	EXT3: Ecosystem dynamics	Changing conditions and environmental requirements	N	N	Y	N
		New distribution channels that were not operational before	N	Y	N	N
	EXT4: Regulatory framework	Regulatory initiatives related to the use of competitive technologies in the operating industry	N	N	Y	N
		Favourable regulatory frameworks and initiatives are in place that the organisation can join	N	N	N	Y
	EXT5: Innovation Infrastructure	Equipped but not ready to lead yet	N	N	Y	N
		Inspire others in its ecosystem to realise the joint vision	N	N	N	Y

Source: Authors

Figure 3
Response Types to Changing Conditions and Disruptive Events



Source: Author's illustration

Case Study

Case study description

To demonstrate the application in a real environment, an initial evaluation has been performed by applying this conceptual framework in a real case study. Tables 1, 2, and 3 were used as a data collection instrument as a questionnaire sent to a CIO equivalent position in a mid-sized Croatian IT company. The company is known for its progressive and proactive approach to developing information systems, with experience in digital transformation initiatives in the IT sector. The person who participated in the data collection is an experienced IT professional with leadership experience and a strong collaboration orientation with customers and employees.

Case study results

The response is shown in tables 4, 5, 6, 7, and 8. Results indicate that the company's ultimate goal is transformation, as stated in the questionnaire, along with notes that, as a company, they feel quite ambitious and self-critical, so probably some companies in a similar situation would rate themselves better. Still, they intend to raise the bar for themselves and their partners to be more competitive and their customers and employees more satisfied.

Table 4
Readiness and Willingness Assessment Instrument - Internal Factors – Case Study

Internal influence factors	To what extent is my organisation ready to change?	What are we trying to achieve?
INT1: Strategy orientation	High	High: Clear vision and stakeholder support.
INT2: Customer centricity	Medium	High: We want to develop our customer community, especially new market segments.
INT3: ICT and process infrastructure	Medium	High: We need to manage our data in an integrated, secure, and reliable way.
INT4: Talent, capability, and capacity strengthening	Medium	High: We must develop a fully organisational culture based on innovation, talent development, and high ethical values.
INT5: Innovation culture and organisational commitment	High	High: We need to extend our best practices to our ecosystem.

Source: Authors

Table 5
Readiness and Willingness Assessment Instrument - External Factors – Case Study

External influence factors	To which extent is my organisation ready to change?	What are we trying to achieve?
EXT1: Change of technology	Medium	High: We must find new funding and partnerships for future readiness improvement.
EXT2: Competitive pressure	Medium	High: We have the ambition to be the regional leader in our main domains/industries
EXT3: Ecosystem dynamics	Medium	High: Our goal is to orchestrate our business community sustainably and with benefits for all major stakeholders.
EXT4: Regulatory framework	Medium	High: There is a relevant regulatory framework, and we are part of new regulatory initiatives.
EXT5: Innovation infrastructure	Poor	Medium: Our company has a business opportunity to participate in innovation ecosystem initiatives and communities.

Source: Authors

Table 6
Readiness and Willingness Assessment Table -Case Study -Gaps

	Decision factors	Rules	Change			
			Terminal	Temporal	Transitional	Transformational
Gaps	Readiness/ willingness	Willingness marks are high, but most readiness marks are poor across internal and external influence factors	Y	N	N	N
		Internal willingness marks are high, but most external factors are poor	N	Y	N	N
		The readiness-willingness gap is 1 for most internal factors and not greater than 1 for some external factors, and the willingness marks are mostly high.	N	N	**Y**	N
		The gap between readiness and willingness is 0 or not greater than 1, and most willingness marks are set high.	N	N	N	Y

Source: Authors

Table 7
Readiness and Willingness Assessment Table – Internal factors

	Decision factors	Rules	Change			
			Terminal	Temporal	Transitional	Transformational
Internal factors	**INT1: Strategy orientation**	The organisation is aware that the new normal is in place	N	N	**Y**	**Y**
		Mature enough to make a breakthrough	N	N	**Y**	**Y**
	INT2: Customer centricity	Customer experience management is a priority	N	N	N	**Y**
		Changing conditions related to customers	N	N	**Y**	N
	INT3: ICT and process infrastructure	Technology-driven paradigms are becoming essential	N	N	**Y**	N
		Technology-supported improvement designs are in place	N	N	N	**Y**
	INT4: Talent, capability, and capacity strengthening	No resources are available	Y	**N**	**N**	**N**
		Substitute resources available	N	**Y**	N	N
	INT5: Innovation culture and organisational commitment	Explorational capacities are not scaled enough	N	N	**Y**	N
		Reinvent its business model.	N	N	N	**Y**

Source: Authors

Table 8
Readiness and Willingness Assessment Table – External factors

	Decision factors	Rules	Change: Terminal	Change: Temporal	Change: Transitional	Change: Transformational
EXTERNAL	EXT1: change of technology	The industry maturity curve is declining or reaching the zero-demand point	Y	**N**	**N**	**N**
		Technology-supported operations available	N	**Y**	N	N
	EXT2: competitive pressure	The business model needs substantial improvements	N	N	**Y**	N
		The business environment has changed so severely that operations are no longer feasible	**Y**	N	N	N
		Global disruptions and lockdowns	**Y**	N	N	N
	EXT3: ecosystem dynamics	Changing conditions and environmental requirements	N	N	**Y**	N
		New distribution channels that were not operational before	N	**Y**	N	N
	EXT4: regulatory framework	Regulatory initiatives related to the use of competitive technologies in the operating industry	N	N	**Y**	N
		Favourable regulatory frameworks and initiatives are in place that the organisation can join	N	N	N	**Y**
	EXT5: innovation infrastructure	Equipped but not ready to lead yet	**N**	**N**	Y	**N**
		Inspire others in its ecosystem to realise the joint vision	N	N	N	**Y**

Source: Authors

Table 9
Number of potential decisive marks

Decision factors	Rules	Change: Terminal	Change: Temporal	Change: Transitional	Change: Transformational
Sum of potential decisive marks in Tables 6, 7, and 8		**2/3**	**3/6**	**8/10**	**7/10**

Source: Authors

The potential decisive marks in Tables 6, 7, and 8 are assessed with company representatives, and their value is presented in blue-coloured cells. Based on the number of Yes answers in potential decisive marks (which can have a decisive Yes or No value for the appropriate response type, depending on the question), the recommendation is a close call between transitional (8/10) and transformational (7/10) response type to changing conditions and disruptive events.

Considering the gap analysis, the final recommendation of transitioning would be more appropriate: although the company shows an appropriate level of maturity for

transformational change, the external factors set such environmental conditions, which impact the overall mark to the transitional response type.

Evaluation of the Case Study

The case study shows that the framework helped rethink the complex factors impacting the response to changing conditions and disruptive events. In the free-form feedback information, the participant stated that the framework confirmed most of the company's existing strategic determinants and business thinking, and they would like to consider the issue of generational challenges and the issue of dual strategy operations. The dual strategy operations are feasible since applying the proposed framework was a close call. Therefore, 2 scenarios of change emerged as possible paths to go. Previous and ongoing global disruptions have impacted, and still do, the business environment so severely that transitional change at this point would be a less risky decision. In similar cases of operating in highly disruption-sensitive ecosystems, we recommend applying complementary methods and techniques for analysing the industry's and business environment's potential. In this case, the recommendation is to opt for the transitional change while bridging gaps for the next step of transformation; sensible CIO, CEO, or CXO can also choose the option of Transformative change. Still, in that case, more efforts are required in the readiness score, meaning that the executives need to rethink to what extent the organisation is ready to change and at what cost.

The suggestion for improving the framework from the case study participants is to develop an interactive tool for the framework application, both for availability for ease of use but also for additional benefits (tracking, automatic processing of results, tracking trends in case of multiple consecutive fillings by the same entities, etc.).

Discussion and Implications

This research aimed to develop and present a conceptual framework that should help organisations steer change or innovation endeavours to the most feasible option when faced with intense disruption and uncertainty in their operating environment. The following approach was applied: (1) already well-known models, concepts, and frameworks were reviewed; (2) internal and external factors influencing digital transformation readiness and willingness were explored; (3) a 4-step conceptual framework was designed; (4) an assessment instrument was created to assist organisations in assessing their readiness and willingness, positioning and deciding on response options, and finally (5) the framework was tested through a case study. Each part of this journey brought us new insights. First, already known models, concepts, and frameworks are oriented towards assessing the readiness, i.e., capabilities or complex dynamics within ecosystems. This led us to the second important insight: the need to classify internal and external factors influencing digital transformation readiness and willingness. Those factors were explored and modified for bringing into equation disruptions and uncertainty when weighing alternatives for exposing organisational existing and future operational business models to different response needs. Third, the importance of balance between readiness and willingness while unveiling disruptions and uncertainty gave us insights into the complexity, which we tried to minimise by designing the 4-step conceptual framework. Fourth, developing an assessment instrument that assists organisations in assessing their readiness and willingness aims to enable organisations to take the right position before deciding on response options. This revealed to be an opportunity to do a reality check - if performed objectively – and admit that both can be feasible options: to Continue (do nothing) or (in a Terminal, Temporal, Transitional, or Transformational manner). Fifth, the case study

revealed that the assessment instrument was useful in positioning organisational readiness and willingness and steering the response. Still, it also allowed the participating organisation to identify complementary opportunities for exploitation and growth related to their view on internal and external capabilities and challenges. All these insights gained through this journey added to the basic contribution of our approach to assisting organisations in uncovering feasible response types of action while dealing with intense disruption and uncertainty in their operating environment.

Relations to Previous Findings

The results of exploring our newly developed framework comply with existing digital maturity models for assessing digital transformation and digital maturity (Evans, 2017; Forrester, 2018; Government of South Australia, 2022; TM forum, 2020; e-Schools, 2018) through pillars of Digital transformation identified in (Pihir et al., 2018). The pillars became an essential part of the framework as internal influence factors, which can be evaluated through questions and statements offered in the framework. External influence factors, gathered mainly from previous projects and research experience of the authors and described in the same section, together with the internal ones, give a unique complementary and balanced but upgradeable set of factors for readiness and willingness assessment under disruptions and uncertainty. Therefore, our framework emphasises the balance between what an organisation is ready to achieve concerning what it is willing to achieve while considering the dynamics in the operational environment. That is why it is not only supposed to give the as-is state but can be used to show feasible directions or paths towards an appropriate response concerning exploitation opportunities.

Implications for Academia and Practice

Regarding possible implications, the contribution of this research is twofold. Regarding potential academic implications, both the research journey and empirical results add to understanding the ecosystem's complexity and dynamics. At this point, the proposed conceptual framework is intended to be a tool for discussing the business context at the high level of organisational and business processes governance to draft a general strategic direction towards digital transformation when faced with intense disruption and uncertainty in the operating environment. Existing methods like Business model canvas (Osterwalder et al., 2015) or the BPM Billboard (vom Brocke et al., 2021) can be applied for translation into initiatives or projects. Besides adding to research on digital transformation, the applied Design Science Research methodology is inspired by customer centricity, knowledge engineering, and creative design thinking methods and techniques for guiding new initiatives towards identifying problems and motivating solutions which are addressing those problems while reducing the complexity to a small number of internal and external factors presented in Table 3.

Implications for practice arise from the empirical part of this research, namely from the case study, illustrating the application of the proposed framework. The case study participants supported our assumption that although considering various factors within a complex environment, capability, and future vision can be explored well-enough by applying a reduced but balanced set of questions and statements, offering to concentrate on important opportunities and challenges. The case study showed that the proposed framework could be used to assess the position of what an organisation is capable (or ready) of what can be achieved (willingly) in a feasible manner. Managerial implications on selecting feasible strategic directions are related to two main strategic directions. The less probable case of optioning is to change nothing and continue with current business models because the operating industry is

not affected enough to cause the need for a response. For other more probable cases, the need for a response is genuine, and organisations can estimate the need for a response by rethinking changing conditions and disruptive events and then select one out of four options: terminal change, temporal change, transitional change, or transformational change. Each strategic direction impacts resource allocation as one of the most important managerial jobs, addressing the scope of response and timing. Therefore, an operational instrument for assessing when and what to do seems worth presenting.

Conclusion

Summary of research

This paper proposed a conceptual framework for steering change or innovation endeavours while considering organisational readiness and willingness to change when faced with disruptions. The framework application process is designed to assess the readiness (To which extent is my organisation ready to change?) and willingness (What are we trying to achieve?) when initiating a future digital transformation.

Internal and external factors that affect the digital transformation process in organisations are gathered from previous research and literature review. These internal and external factors have been identified as influence factors for selecting response types to changing conditions and disruptive events. Depending on the organisation's willingness and readiness, but also depending on the ecosystem and industry context of operations, besides doing nothing and continuing with current business models, for other more probable cases, feasible response types can be described as terminal, temporal, transitional, and transformational change. The framework helps management select appropriate organisational change options that could lead an organisation towards digital transformation. Therefore, the proposed conceptual framework is designed to support organisations in the balanced exploration of readiness and willingness about exploitation opportunities in environments under disruptions and uncertainty.

Limitations

The case study shows that the framework helped build awareness of the limiting and encouraging factors of the operating environment in performing projects and initiatives related to digital transformation. Certainly, the limitation of this research is its reliance on expert and professional experiences forming an understanding of the market's behaviour, industry vortex strengths, and technology impact, as well as of the assessment instrument and its interpretation into feasible options of change.

Another limitation of this framework is its interpretability because a whole variety of marks and their interpretation lies in the background of this framework, especially since this is not an operational calculation of marks but seeks a deeper understanding of markets and industries. The next limitation of the proposed model framework is that in case of close results, it does not have to provide a single concrete solution but often can help clarify the readiness or willingness issues. To deal with this or similar situations, complementary methods and tools can be applied to guide the decision more straightforwardly. In case of a disruption that happens kind of doubt, the Digital Vortex (Loucks et al., 2016) can help evaluate options within a specific industry. In the resource availability gap, the Blue ocean strategy method (Kim & Mauborgne, 2021) can give insights into how the competition deals with similar challenges.

Future research directions

In further research, more attention should be put to identifying and resolving the limitations of the proposed framework and making this tool an easy-to-use strategic assessment tool supported by a digital tool to make the framework easier-to-use. The contribution to the operational translation of the proposed concepts from the organisational governance level into operational inputs could be implemented to develop more case studies and test the framework over longer periods, in different industries, across different organisational demographics, and among different transformational scopes. Better communication of the framework to other involved or affected stakeholders for mutual learning and improvement. In addition, the synergy of industry-public and administration-research institutions is most welcome, especially since each stakeholder can contribute to building better mutually supported initiatives.

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About the authors

Katarina Tomičić-Pupek, PhD, is an Associate Professor at the University of Zagreb, Faculty of Organization and Informatics, Croatia. Her teaching activities and scientific and professional engagement are related to business process modeling, strategic planning of information systems, design thinking, and digital transformation. The author can be contacted at **katarina.tomicic@foi.unizg.hr**

Martina Tomičić Furjan, PhD, is an Associate Professor at the University of Zagreb, Faculty of Organization and Informatics, Croatia. Her teaching engagement areas of scientific and professional interests are related to digital transformation, strategic development and implementation of information and communication technologies in organisations, operations management, and performance measurement. The author can be contacted at **martina.tomicic@foi.unizg.hr**

Igor Pihir, PhD, is an Associate Professor at the University of Zagreb, Faculty of Organization and Informatics, Croatia. His teaching engagement, academic and professional interests include business process modelling and improvement, application of information and communication technologies, digital transformation, and measurement of organisational efficiency. The author can be contacted at **igor.pihir@foi.unizg.hr**

Neven Vrček, PhD, is a Full Professor, researcher, and former dean at the University of Zagreb, Faculty of Organization and Informatics, Croatia (UNIZG-FOI). His areas of academic and professional interest are digital business, digital government, information society development, organisational performance measurement, and software engineering. He is a member of several professional and academic associations and has been a member of several auditing and advisory boards. He is also professionally involved in consulting activities related to smart industry development and related disciplines. The author can be contacted at **nvrcek@foi.unizg.hr**