

T.C.
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SOSYAL BİLİMLER ENSTİTÜSÜ
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YÖNETİM VE ORGANİZASYON (İNGİLİZCE) BİLİM DALI

**ORGANIZATIONAL RESILIENCE IN THE HEALTHCARE INDUSTRY: THE
IMPACTS OF DIGITAL TRANSFORMATION AND THE ROLE OF
INTELLECTUAL CAPITAL**

Doktora Tezi

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ÖZET

SAĞLIK SEKTÖRÜNDE ORGANİZASYONEL DAYANIKLILIK: DİJİTAL DÖNÜŞÜMÜN ETKİLERİ VE ENTELELÜKTEL SERMAYEMİN ROLÜ

Dayanıklılık kavramı birçok araştırma alanında ele alınmış olup, organizasyonel anlamda hem araştırmacılar hem de uygulayıcılar açısından giderek artan bir öneme sahip olmuştur. Organizasyonel dayanıklılık, organizasyonların beklenmedik yıkıcı durumlarda bu olaylarla başarılı bir şekilde başa çıkabilme, faaliyetlerini kesintisiz sürdürebilme, toparlanabilme ve gelişim gösterebilme yeteneğidir. Dijital dönüşümün organizasyonlarda dayanıklılığı artırabileceği görüşü kabul edilen görüşler arasındadır. Literatürde sağlık kuruluşları için organizasyonel dayanıklılığın incelendiği araştırmalar oldukça yenidir, ayrıca dayanıklılık üzerine dijital dönüşümün etkilerini araştıran çalışmaların çok az olduğu görülmektedir. Bu çalışmada, Türkiye'de sağlık alanında faaliyet gösteren organizasyonların dayanıklılıkları, dijital dönüşüm ve entelektüel sermayenin etkileri açısından araştırılmıştır. Regresyon analizinin bulguları, sağlık kuruluşlarında dijital dönüşümün organizasyonel dayanıklılığı artırdığını ve entelektüel sermayenin bu ilişkide aracılık etkisinin olduğunu ortaya koymuştur. Araştırma hipotezleri Yapısal Eşitlik Modellemesi kullanılarak da analiz edilmiş ve dijital dönüşümün organizasyonel dayanıklılık üzerindeki olumlu etkisini ve entelektüel sermayenin aracılık etkisi olduğu ortaya konmuştur. Bu kapsamda klasik yöntemlerle test edilen araştırma sonuçları, Yapısal Eşitlik Modellemesi ile teyit edilmiştir. Çalışmanın sonuçlarına göre, Türkiye'de sağlık sektöründe yer alan organizasyonlarda hem dijital teknolojilere yatırım yaparak dijital dönüşümün artırılması, hem de çalışanların eğitim ve yeteneklerine yönelik yatırımlarla ve paydaşlarıyla olan ilişkilerini güçlü tutarak entelektüel sermayenin artırılması, organizasyonların dayanıklılıklarını artıracaktır.

Anahtar kelimeler: Organizasyonel dayanıklılık, dijital dönüşüm, entelektüel sermaye

ABSTRACT

ORGANIZATIONAL RESILIENCE IN HEALTHCARE INDUSTRY: THE IMPACTS OF DIGITAL TRANSFORMATION AND THE ROLE OF INTELLECTUAL CAPITAL

The concept of resilience has been addressed in many research areas and has become increasingly important for researchers and practitioners in the organizational sense. Organizational resilience is the capability of organizations to deal successfully with unexpected disruptive situations, to continue their activities without interruption, and to recover and develop. It is among the accepted views that digital transformation can increase resilience in organizations. In the literature, research examining organizational resilience for healthcare organizations is quite new, and there are very few studies investigating the effects of digital transformation on resilience. In this study, the resilience of organizations operating in the field of healthcare in Turkey was investigated in terms of the effects of digital transformation and intellectual capital. The findings of the regression analysis revealed that digital transformation increases organizational resilience in healthcare organizations and that intellectual capital has a mediating effect in this relationship. Sobel test results supported the mediation effect of intellectual capital on digital transformation organizational resilience relation. The research hypotheses were also analyzed using Structural Equation Modeling, which revealed the positive effect of digital transformation on organizational resilience and the mediating effect of intellectual capital. In this context, the research results tested by classical methods were confirmed by Structural Equation Modeling. According to the results of the study, increasing digital transformation in organizations in the healthcare sector in Türkiye by investing in digital technologies, as well as increasing intellectual capital by investing in the education and skills of employees and keeping strong relationships with their stakeholders, will increase the resilience of organizations.

Keywords: Organizational resilience, digital transformation, intellectual capital

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ABBREVIATIONS

AVE	: Average Variance Explained
CFI	: Comparative Fit Index
DCV	: Dynamic Capabilities View
EHR	: Electronic Health Record
EMRAM	: Electronic Medical Records Adoption Model
HIMSS	: Healthcare Information & Management Systems Society
ICT	: Information & Communications Technologies
IFI	: Incremental Fit Index
IT	: Information Technologies
KMO	: Kaiser-Meyer-Olkin Sampling Adequacy
MHRS	: Central Physician Appointment System
RBV	: The Resource Based View
R&D	: Research and Development
RMR	: Root Mean Square Residual
RMSEA	: Root Mean Square Error of Approximation
SEM	: Structural Equation Modeling
TLI	: Tucker Lewis Index
WHO	: World Health Organization

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1. INTRODUCTION

Globalization and the internationalization of activities of organizations have caused the business world of today to become more uncertain, rapidly changing, and complex. Rapidly increasing changes and uncertainties in recent years have increased the urgency for organizations to cope with these situations (Teixeira & Werther, 2013). Today, global crises, unexpected challenging situations, and environmental uncertainties lead organizations to focus on increasing their resilience by establishing robust systems (Berkes, 2007). In this context, organizations may need to get through challenging conditions like economic and political fluctuations, natural disasters, or crises that may occur at unexpected times, economic turmoil, environmental shocks, or any other external disruptions. Since such situations are often unpredictable and not at a point that can be controlled, they may have an impact that threatens the uninterrupted continuation of the activities of organizations. When exposed to such unexpected disruptive events, it is critical for organizations to manage these challenging conditions to continue their business uninterrupted.

In the face of these situations or disruptive events, organizations need to act in a timely and flexible manner to survive and develop. In this way, they can be prepared for other possible challenges by taking a resilient stance. When evaluated from this perspective, how organizations will follow the management of risks that may occur in many different destructive events or crises has become an issue that should be focused on by both those who make and implement decisions in organizations and by researchers in the academic field. With the increase in crises and economic turmoil, the ability of organizations to intervene and overcome these situations has become a critical issue (Penades et al., 2017). In this context, addressing organizational resilience and how to develop it has become an important issue for both researchers and decision makers in the organizations. In organizational theory, the importance of studies on addressing organizational resilience and how to achieve and increase it has gradually increased. The resilience approach in organizational theory also offers a new way for organizations to develop more effectively. Robust and resilient organizations demonstrate the capability to manage natural disasters effectively as well as economic and political crises (Barnet & Pratt, 2000).

Organizations need to pay attention to various social, environmental, economic, and societal factors to survive and ensure sustainability and continuity in their activities. In addition to these factors, organizations often struggle with threats brought by various disruptive events and crises (Burnard & Bhamra, 2011). Challenging situations that organizations face not only negatively affect them economically but also threaten their survival. Such challenging situations are inevitable in the business

world, but organizations differ in their response and resilience, with some organizations coping better and becoming more resilient than others.

Organizations need to develop new and different strategies and redesign their existing strategies to protect against and avoid these threats. The capability of an organization to come through a destructive event or crisis and improve its ability to do so depends on its organizational structure, operational systems, and management structure, and therefore the resilience of all of these. The concept of resilience is very important when it comes to the ability of organizations to cope with constantly changing environmental conditions, challenging competition, and emerging crises, and to adapt to changing and uncertain environmental conditions (Bhamra et al., 2011; Burnard & Bhamra, 2011; Robb, 2000).

The resilience of organizations refers to a more dynamic process beyond adapting to any environmental change and being prepared for a possible adverse situation (Nelson, Adger & Brown, 2007). Benn Dunphy & Griffiths (2014) argue that resilient organizations can maintain their survival and sustainability in the face of destructive events and maintain their capability to continue to develop and accomplish their organizational goals.

Resilient organizations have the capacity to withstand and adapt to stressful or disruptive events, adverse changes that occur expeditiously, or various economic fluctuations and crises (Clément and Rivera, 2017). Organizations must demonstrate resilient behavior to manage and overcome the various environmental shocks they are exposed to. Organizations with high resilience can adapt in a timely manner and develop and shape a new capacity when faced with various dramatic changes.

There are many conceptual studies aimed at exploring the benefits of resilience of organizations, and the topic of resilience in the organizational context has attracted increasing attention from scholars from various perspectives (Alliger et al., 2015; Oeij. et al., 2017), also resulting in a rising trend in the academic publications as well (Annarelli & Nonino, 2016).

Although the concept of resilience is increasing in popularity, resilience in the organizational field is still an emerging and developing field compared to research in other disciplines (Ma et al., 2018). In organizational context, research on the concept of resilience, which is briefly considered as the capacity of organizations to adapt to challenging situations, to act against difficulties by taking quick and timely actions, and to subsequently recover and develop, has become increasingly the focus of attention (Alliger et al., 2015; Bhamra et al., 2011; Castellion & Markham, 2013; Powley, 2009).

In the existing literature, there are numerous definitions of organizational resilience and the scholars have not yet reached consensus on the definition and the assessment the ability of organizational resilience. It is noteworthy that existing research in the literature on resilience is mostly theoretical and focuses on structural theories, and there are few empirical studies on this subject (Patriarca et al., 2018).

Existing studies related to the concept of resilience in an organizational context also focus on conceptualization of the concept, and review of the literature (Annarelli and Nonino, 2016). Qualitative and theoretical studies dominate the existing organizational resilience literature currently. At this stage, scholars are mainly interested in theory building in the field of resilience in organizational research (Burnard & Bhamra, 2011). Despite the developments in the research of the resilience concept during the last two decades, few studies have used empirical quantitative research methods to examine the resilience of organizations (Oeij et al., 2017; Van Der Vegt et al., 2015). Thus, the question of how an organization can achieve and sustain resilience at the organizational level is still being researched (Boin & Lodge, 2016; Linnenluecke, 2017; Chen et al., 2021). Therefore, more research is still needed to understand what influences resilience and how organizations can increase their resilience.

The research is based on the idea that organizations need digital transformation and intellectual capital to increase their resilience when they are exposed to unexpected situations and crises. Among the prominent opinions about organizational resilience is that digital transformation is effective in supporting organizations to achieve resilience (Velu et al., 2019). Digital transformation has been a crucial way for organizations to increase organizational resilience, and it has been a topic addressed from many perspectives by both academia and business practice. Despite the increasing importance of the topic of digital transformation, existing studies mostly address issues related to the conceptualization of digital transformation and its antecedents and consequences. It is noteworthy that there are very few studies on the relationship between digital transformation and organizational resilience in the organization literature.

In the service industry, and particularly in healthcare organizations, the likelihood of an unexpected situation or crisis is high because of many factors. These include being in service-intensive structure, the necessity for a high interpersonal interaction, being highly dependent on service providers and technology, and being greatly affected by the perceptions of service recipients. Risks such as changes in legislation regarding health systems, problems arising from the system, natural disasters, the emergence of pandemics and epidemics, or major accidents are among the risks that can be seen in the healthcare industry and may affect organizations. All these risks make healthcare organizations sensitive to changes in their environment. Hence, both practitioners and researchers are becoming more aware of the increasing importance of organizational resilience in healthcare organizations, thus leading to strategy research (Panos et al., 2009). Considered from this perspective, the development of the conceptualization of organizational resilience in the healthcare industry as well as its empirical investigation has become a precedence for the research in this field.

Intellectual capital is crucial in organizations and considered as an intangible resource for organizations for its sustainable competitive. It consists of three components namely human capital, structural capital

and relational capital (Wiklund & Shepherd, 2003). In the past decades, its importance has been emphasized by the researchers. The studies related to intellectual capital and organizational resilience in the existing literature are quite limited.

For this purpose, in this empirical study, the effects of digital transformation on organizational resilience of healthcare organizations were investigated. The effect of intellectual capital has also been explored in the relationship between digital transformation and organizational resilience. In the first section, the resilience concept and organizational resilience concept, the factors, the antecedents, and the theoretical background of organizational resilience were presented. After that, the concepts of digital transformation and intellectual capital were explained. Then, the research methodology, the results of the research, and the implications of the research were presented.



2. LITERATURE REVIEW

2.1. Organizational Resilience

In this section first, the resilience concept is explained, then the organizational resilience is elucidated. Later, the other concepts related to organizational resilience are discussed.

2.1.1. The Concept of Resilience

The emergence of the word of “resilience” is based on the Latin words "resilire" and "resilio,” which mean to bounce back (Williams et al., 2017). Since the term resilience is used in a wide variety of fields, resilience has many definitions depending on its uses in these fields. Some of the research fields where the term resilience is used are engineering, organization, ecology, sociology, and economics (Annarelli & Nonino, 2016).

The resilience word was first used scientifically in the physical science literature. In physics, resilience refers is described as the capacity of a system to regain its former form in the aftermath of a deterioration. In the engineering discipline, it is considered as the capability of materials to get back to their original standing following a deformation. In the sociological context, resilience is expressed as the ability to cope with any extraordinary situation personally, organizationally or socially, or to adapt to the situation and overcome it (McManus et al., 2008).

There are differences in existing conceptualizations of resilience; therefore, there are many understandings and definitions of the concept. According to the definition by Wildavsky (1988, 1991), resilience can be considered as the capacity to tackle and recover from unanticipated dangers when they occur and learn to bounce back after they arise. In this sense, resilience is about successfully overcoming challenges.

In another definition, resilience concept is described as the ability of a system to prevent or keep negative consequences to a minimum and quickly overcome these consequences (Westrum, 2006).

Cutter et al. (2008) described resilience as the capacity of a social system to cope with challenging situations by responding to these situations, recovering, and absorbing the effects, and included the stages that initiate the capability of the social system to alter and reorganize.

Resilience has also been defined as the capability of an organization to change before the environmental change situation becomes quite evident, in a sense, to change by anticipating the situation in advance

(Somers, 2009; Hamel & Valikangas, 2003). Resilience can be briefly defined as recovery after a stressful situation. In studies on the concept of resilience, it is emphasized that the concept is multidimensional, and it is also discussed at various levels, including individual, social, and organizational.

Considering the basic commonalities of definitions in different disciplines, resilience refers to the responses to unexpected changes and situations and the capacity to align with these events (Erol et al., 2010).

In social sciences, resilience was first discussed at the individual level and examined as a subject of psychological science (Lengnick-Hall et al., 2011). Discussion of the concept in management science began with the studies of Staw et al. (1981), Meyer (1982), and Weick (1993). With the increase in global threats such as economic crises, economic turmoil, and other challenging situations, resilience has become an even more remarkable concept (Annarelli & Nonino, 2016). As for the post-stress stage, some scholars consider this stage as an opportunity for organizations to take advantage of potentially adverse situations that threaten the uninterrupted continuation of their activities, and to be involved in transformative activities in the organization (Lengnick-Hall et al., 2011).

In another definition, this transformative perspective on resilience is expressed as the ability of an organization or a community to adjust functioning positively before, during, and after unexpected events and to create and use new capabilities (Williams et al., 2017).

2.1.2. Organizational Resilience Concept

Meyer and Rowan (1977) opened the door to organizational resilience research and included resilience in management research. Although scholars differ in their definitions, and they have not reached a consensus on the description and conceptualization of resilience in the organizational context. Most scholars believe it is a robust ability to adapt and eventually benefit from destructive surprises that have the potential to threaten their ability to continue their activities (Williams et al., 2017).

Extraordinary or challenging situations that require organizations to be resilient have the potential to have disruptive or harmful impacts on the organizations. Organizations perceive a specific situation as a risk depending on the extent, time, and the location of the event. Extraordinary situations may pose significant uncertainties for the organizations, as these events not only affect the functioning but also the survival of the organizations. For this reason, Meyer (1982) described extraordinary events as environmental disruptions. These events can occur in a wide variety of ways, from various weather events to infrastructure insufficiency, from epidemic to economic uncertainties. Today, it is clearly seen

that the frequency of such extraordinary events increases, and all organizations are affected, from the smallest to the largest (Sullivan-Taylor & Branicki, 2011).

In the organizational context, the concept of resilience is defined differently by many authors. Resilience in the organizational context refers to the basic characteristics of an organization to react to substantive changes that have negative effects on it (Horne & Orr, 1998). Resilience can also be considered as the ability of organizations to recover from adverse situations (Linnenluecke et al., 2012). These definitions emphasize the resistance and recovery capabilities of organizations.

Organizational resilience, shortly, is the capability of bouncing back organizations to their previous state before adverse situations (Boin & Eeten, 2013), or the capability of self-renewing of the organization over time through innovation (Reinoeller & van Baardwijk, 2005).

Organizational resilience is defined as the capability of organizations to maintain their positive situation by becoming stronger and more resourceful when faced with challenging conditions such as crises, economic turmoil, external shocks, challenging competition, tensions, and stress (Vogus & Sutcliffe, 2007).

Organizational resilience is the capability of an organization to deal with an extraordinary situation, or crisis, and anticipate the threats that will occur potentially, and take necessary measures to maintain survival and continue to improve. In other words, resilience in organizational meaning is the capability of an organization to remain successful through adaptive or transformative processes when faced with challenges and adversities. This definition emphasizes that being resilient does not only mean responding to external forces but also providing the necessary conditions to anticipate unknown but high-risk threats, thus keeping them under control and allowing them to react flexibly and adaptably.

Organizational resilience means more than a specific adaptation, as it involves the ability to use resources in new situations by activating and restructuring them when difficulties arise. In this context, it can be said that the expertise gained by the organization in a particular challenging situation increases the possibility of gaining expertise in subsequent situations, rather than being used linearly in subsequent situations. Resilience states that the learning of an organization from past experiences can lead to future learning, but it is based on the development of broader capabilities independent of the act of learning. It is easier for resilient organizations to monitor their environment and perceive and detect possible unexpected situations in a shorter time, and to develop skills against disruptions and unexpected situations in a timely manner rather than eliminating those (Weick & Sutcliffe, 2001).

In the conceptualization of organizational resilience by Linnenluecke and Griffiths (2010), it is emphasized that it is pertains to the abilities of organizations to get adapted, learn, and self-organize.

Organizational resilience is the capability of an organization to absorb disruptive events that endanger the survival of the organization, develop a situation-specific response, and consequently, the capacity to handle these events with transformative activities (Lengnick-Hall et al., 2011).

Organizational resilience refers to responding to disruptive situations effectively before, during, and after the situation as well (Alliger et al. 2015; Linnenluecke et al. 2012; Williams et al., 2017). Accordingly, resilient organizations not only take reactive and concurrent actions against past and current emergencies but also respond with anticipatory actions for the future. Organizational resilience can be considered as an aggressive response to unexpected situations and a defensive behavior through endurance or recovery (Lengnick-Hall et al., 2011; Limnios et al., 2014; Weick et al., 1999). This means that the first stage of the organizational resilience process refers to the attempt to expect and prepare for significant changes and developments and potential threats in the environment (Boin & van Eeten, 2013; Somers, 2009). Beyond this, an aggressive response involves purposeful coping during critical situations, and adapting, transforming, and learning after unexpected situations occur (Lengnick-Hall et al., 2011; Rerup, 2001; Weick et al., 1999; Wildavsky, 1991). Keeping all these connotations together, the stages of organizational resilience can be counted as coping, adaptation, and transformation (Hamel & Vaelikangas, 2003; McManus et al., 2008; Williams et al., 2017).

The organizational resilience concept is characterized by other concepts such as recovery, survival, and development (Lee et al., 2013). In this context, resilience is expressed as the ability of organizations to maintain a positive stance during challenging situations and to adjust and maintain their activities (Vogus & Sutcliffe, 2007).

The organizational resilience concept is explained as the capacity to resist unexpected dangers and learn to recover (Kantur & İşeri Say, 2012). According to another definition, resilience is about responding productively to significant changes that disrupt the normal flow, and the state of balance (Horne & Orr, 1998).

According to Annarelli and Nonino (2016), the resilience of organizations is related to overcoming unexpected and challenging situations through strategic awareness and thus manages internal and external shocks. Organizational resilience differs from the concepts of adaptability, flexibility, recovery, robustness, redundancy, and agility. Because organizational resilience stands for the organization's recovery and development by reacting to a destructive situation in situations of uncertainty, urgency and discontinuity.

Despite different definitions of organizational resilience, the definitions put the emphasis on its three basic characteristics of the organization as perception, integration and coordination, and reorganization. Perception means the capability to perceive adaptation to changes in the external environment and

discover early warning signals in an unexpected situation or crisis. Integration and coordination phase expresses the flexibility of organization to mobilize its resources to set against crises. Reorganization is reconfiguring resources and capabilities to make necessary transformations in the organization.

Leflar and Siegel (2013), emphasized that highly resilient organizations ensure collaboration within the organization, consider uncertainties and challenges as opportunities for improvement and strengthening, overcome possible adverse consequences through anticipating environmental changes, learn from adverse events, consider adaptability as a top priority, respond to events with collaborative teams within the organization, and respond and adapt to all situations with agility, and make proactive decisions to respond to and cope with disruptive events.

Resilient organizations have a high level of awareness about themselves, their external environment, and their stakeholders, and they can adapt to changing situations with new solutions and cope with even unexpected problems by using the resources they have.

2.1.3. Organizational Resilience Mechanism

In organizational research, the resilience concept is considered as the ability of organizations to resist and recover from destructive situations, crises, economic and political turmoil, or any other adverse situations that may have impacts on the organizations internally or externally (Luthar et al., 2000).

Regarding this mechanism of organizational resilience, there are two perspectives in the organizational literature (Lengnick-Hall et al., 2011).

The first of these perspectives, which can be called **reactive** or **operational perspective**, organizational stability is viewed as the ability to react to unexpected or adverse events and rebound by avoiding dysfunctional systems. It focuses on the reacting and recovery behavior of organizations and defines organizational resilience as the ability to jump back and continue where it left off after unexpected, stressful, and negative situations (Mallak, 1998; Robb, 2000).

It can be said that the concept of reactive or operational resilience mentioned in this view overlaps with the concept of durability in physical sciences. In physical sciences, resilience refers to the capability to get back to its own form after being strained. When the organizational resilience concept is evaluated in terms of self-recovery, it is generally seen that strategies for coping with difficulties and the ability to quickly return to the expected performance level attract attention. In this case, the efforts of the organization are aimed at restricting dysfunctional and backward-looking activities while adapting to the new situation.

According to this perspective, organizational resilience is seen as the survival skill when faced with threats; it is usually tied to hardiness. It emphasizes the positive adjustment of organization and its capacity to bounce or jump back (Coutu, 2002; Sutcliffe & Vogus, 2003; Worline et al., 2004). Consequently, according to this view, organizational resilience is bounce-oriented and requires courage. This perspective is based on the ecology discipline which organizational resilience is defined as the operational capability of an organization to face an unexpected threat and adapt itself to its previous situation.

In the second perspective, organizational resilience is considered the capability of an organization to absorb situations that jeopardize its survival, develop new capabilities to continue growth and manage transformational activities.

This approach considers the organizational resilience mechanism from a **strategic perspective** that envisages restructuring after the crisis beyond the rebound response. The organization can be able to grow with the challenges; moreover, the organization transforms itself to develop new abilities (Coutu, 2002; Crichton et al., 2009; Lengnick-Hall & Beck, 2003, 2005; Weick, 1988). Accordingly, the resilience concept is considered as strategic organizational resilience. The organizations can improve through strategic organizational resilience, and progress as well (Lengnick-Hall et al., 2011; Vogus & Sutcliffe, 2007). Strategic organizational resilience includes dynamic capabilities that can anticipate disruptive and unexpected events (Hamel, 1991).

This view emphasizes the development of new talents, the ability to adapt to every situation, and the development of new opportunities (Coutu, 2002; Freeman et al., 2004). The ability of organizations to benefit from unexpected changes is emphasized in this perspective. In other words, the emphasis is on not only on dealing with current environmental threats but also on establishing a successful future by taking advantage of opportunities with the resources and capabilities at hand. For this reason, this view is called transformational perspective. Resilient organizations not only bounce back but also improve in uncertain environments and can reach superior performance than before (Lengnick-Hall & Beck, 2003).

Both **operational** or **reactive** and **strategic resilience** are essential to the success of organizations. Resilience in a competitive environment requires more than a return to past performance. Therefore, resilience should be considered in the context of being able to adapt to positive change and bring new opportunities and new capabilities. With a comprehensive approach, organizational resilience can be defined as the capability of the organization to give rise broader opportunities for future success by overcoming current challenges with its resources and capabilities (Megele, 2014).

Organizations need to have specific capabilities to take various actions and shows necessary responds to cope with economic, technological, and other changing or unexpected events. In this context, the

actions and responds related with organizational resilience capability of the organizations are shown in Figure 2.1. It embodies the resilience concept of Holling (1973) indicating bouncing back capability of a system during and after an unexpected situation.

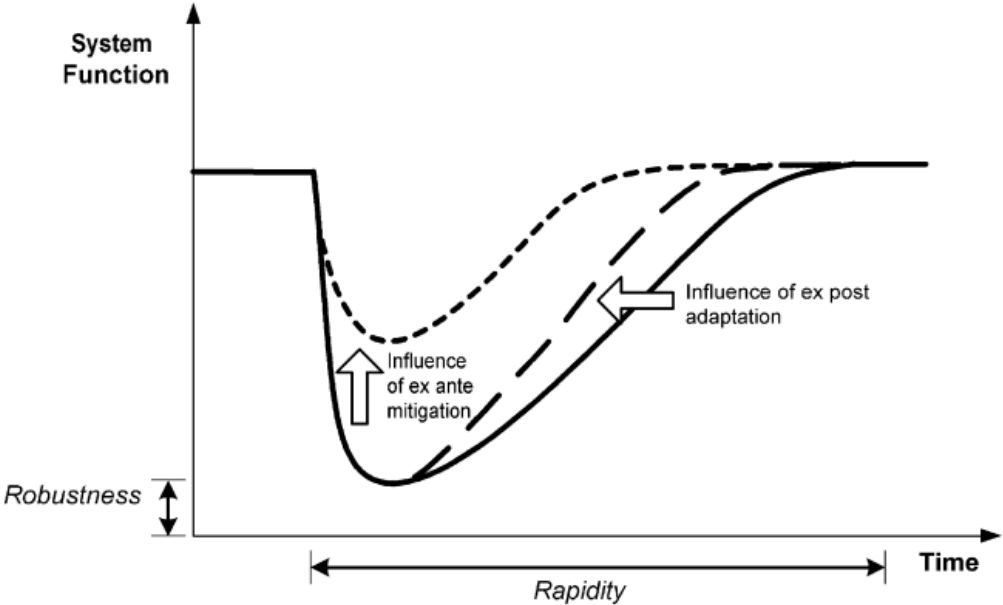


Figure 2.1. Effects of Capabilities and Responds on Organizational Resilience

Source: T. McDaniels, S. Chang, D. Cole, J. Mikawoz & H. Longstaff (2008). Fostering resilience to extreme events within infrastructure systems: Characterizing decision contexts for mitigation and adaptation, *Global Environmental Change*, 18(2): 310-318.

The horizontal line shows the system having operations fixed at a single optimum. When the organization is faced with a changing or challenging condition in its environment, the system might evolve to a different level than it was in the past. The robustness of an organization is the extent to system maintains its functioning to a given external change, which may be a crisis, environmental shocks, or any other adverse situation. The robustness mentioned here is the extent of the function of the system that continues under challenging conditions. Over time, the system approaches an equilibrium state. The speed to reach the equilibrium indicates the rapidity of the organization. It is also demonstrated in the Figure 2.1 that the robustness and rapidity abilities of the organizations can be improved by decision making before the disruptive situation by risk mitigating activities and following the disruption by the response activities as well.

The phases of the resilience mechanism in an organizational context are planning and preparation, sense making, response, and speed.

- 1) **Planning and preparation:** Planning involves considering various competitive action alternatives and plans to act in line with a common goal and vision and to respond or adapt to situations that may cause deviation from this direction. Preparation, on the other hand, is the investments made in actions taken before the need arises, which enables the organization to benefit from sudden situations that occur (Lengnick-Hall et al., 2011). After a sudden incident, the quality of planning and preparation work in the organizations has a decisive role in response and repair.
- 2) **Sensemaking:** It is the way the organization and individuals interpret and give meaning to previously unseen events and situations (Lengnick-Hall et al., 2011). Together with planning and preparatory work, the effort to make sense also affects the quality of response and repair. Because understanding and interpreting events correctly are very valuable for giving the right reaction and implementing the right repair program.
- 3) **Response and recovery:** Response means taking the situation under control, recovering losses, and preventing further damage (Sheffi & Rice, 2005), restoration, on the other hand, involves activities to return to the pre-event situation despite low performance (Madni & Jackson, 2009). If the response and repair are effective and sufficient, the organization is expected to return to normal in a short time.
- 4) **Speed:** Despite not being a stage of the process, speed concerns all stages of the process. It is about the organization making quick decisions when faced with a threat, and quickly implementing these decisions (Sullivan-Taylor & Branicki, 2011), and quickly preventing losses and disruptions (Tierney & Bruneau, 2007). Rapidity means being fast in understanding and making sense of the environment, conditions, sudden events, and possible impacts, making decisions, and implementing processes for reaction and repair, and avoiding unnecessary delays (McDaniels et al., 2008).

The resilience mechanisms of organizations are different from each other. Organizational resilience differs in terms of the reactions of organizations to crises or unexpected events and the subsequent recovery processes (Figure 2.2).

There are two main resilience views regarding the course of organizations starting from the initial state of the functions (denoted as s_1) and the final state in which the resilience outcome stabilizes (denoted as s_2) (Duchek, 2020).

In the first perspective, the capability of organizations to return to their initial states and continue their standard performance indicates that the organizations are resilient (Lengnick-Hall et al., 2011).

In the second perspective, the organizations with high resilience overcome the disruptive situation, improve and regain their standard performances and reached an even higher level of performance (Burnard & Bhamra, 2011; Hamel & Välikangas, 2003). The advanced situation in the resilience

mechanism, that is $s_2 > s_1$, ensures the resilient organizations to leap forward, to improve or become stronger against the potential challenges in the future (Giovannini et al., 2020; Vogus & Sutcliffe, 2007).

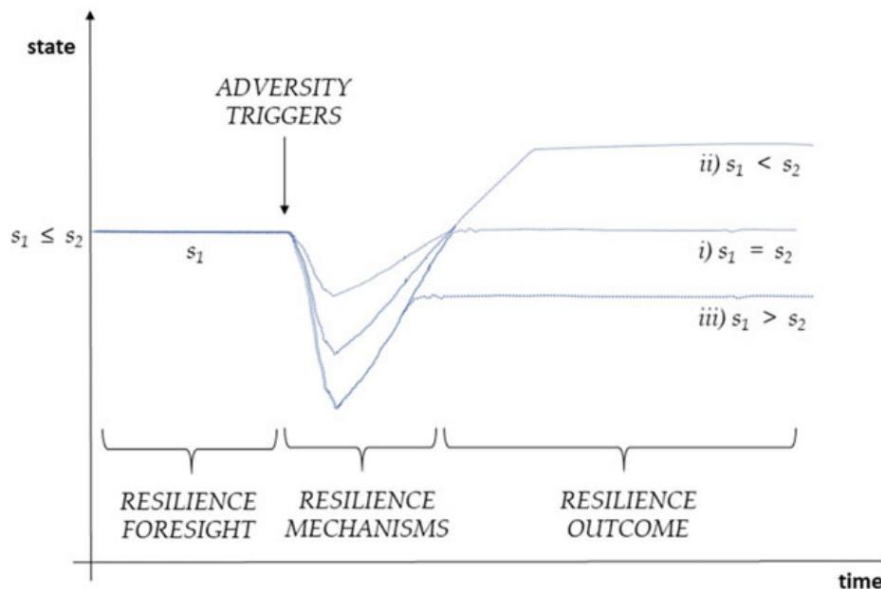


Figure 2.2. Timeline of Organizational Resilience Mechanism

Source: M. L. Frigotto, M. R. Young & R. Pinheiro (2022). *Resilience in Organizations and Societies: The State of the Art and Three Organizing Principles for Moving Forward, Towards Resilient Organizations and Societies A Cross-Sectoral and Multi-Disciplinary Perspective*, e-Book.

In this context, it is possible to distinguish resilience according to how the activities of the organizations progress over a period. Fisher et al. (2019) divided resilience into two as mechanisms that occur immediately after distress triggers occur and consequences that occur after recovery from distress. In this mechanism, the actions that occur before the emergence of the triggers can be called foresight of resilience. In terms of organizational resilience outcomes, the organization can reach its initial state and continue performing at the same level, or become worse than the initial state, or maintain its positive adaptation under challenging conditions and emerge from these situations stronger and with new capabilities (Vogus & Sutcliffe, 2007). Resilience occurs in a reactive way at the level of being prepared and taking precautions to minimize threats and their possible effects, and it can be proactive or dynamic at the level of the ability to bring the organization to its previous position or a better position than before by reducing the consequences of unexpected and disruptive events (Annarelli & Nonino, 2016).

In recent years, there have been comprehensive studies on the conceptualization of resilience that touch upon stages of resilience and capabilities of the organization accompany it at each stage. According to the conceptualization proposed by Duchek (2020), organizational resilience refers to the ability of organizations to deal with adverse events, to build responses specific to each situation, and eventually adapt to changing environmental conditions through transformative activities. In this context, organizational resilience can be evaluated through the stages as anticipation as first stage, coping as the second stage, and thirdly the adaptation stage (Figure 2.3).

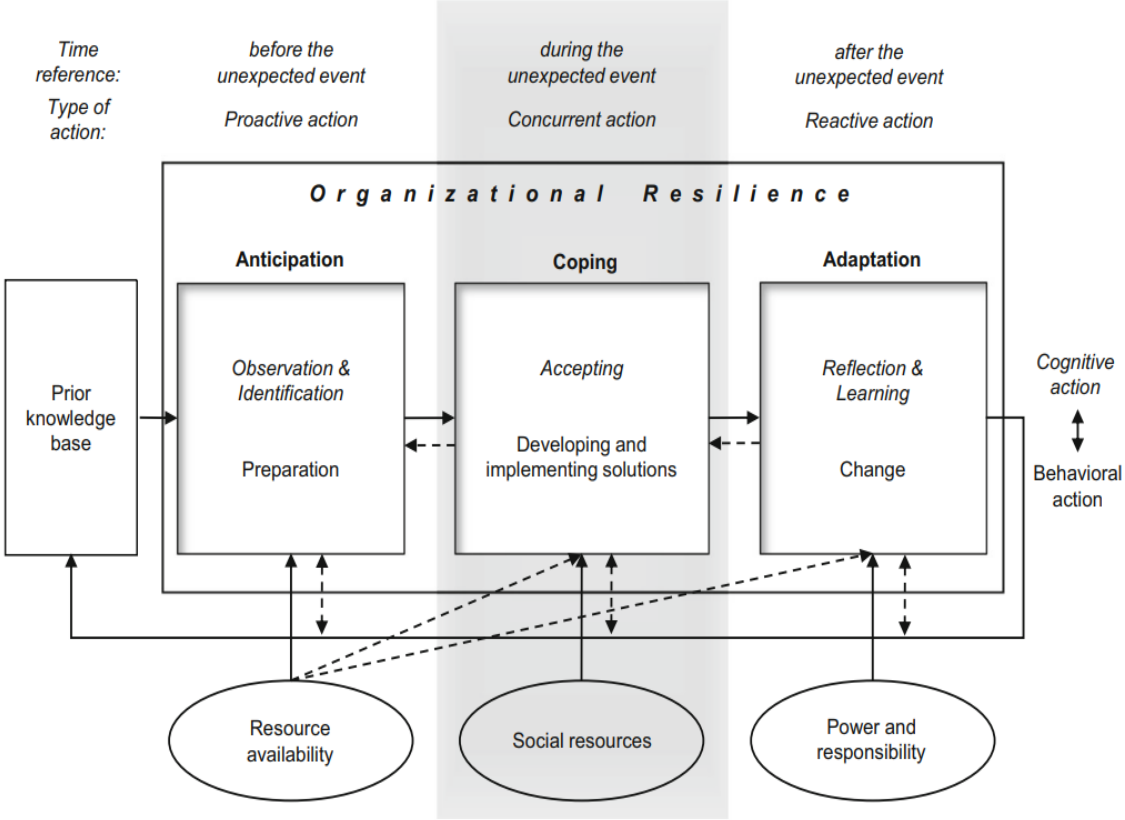


Figure 2.3. Organizational Resilience Mechanism from a Capability Perspective

Source: S. Duchek (2020). Organizational resilience: a capability-based conceptualization. *Business Research*, 13:215-246.

These three stages of organizational resilience are also called the building blocks of resilience in organizations. During these stages, organizations observe and detect potential threats when environmental changes occur. In this way, organizations are prepared for potential negative situations. In order to deal with unexpected destructive situations, organizations must first accept the situation, develop and implement solutions accordingly, and then learn from these situations after the negative situation. Considering all these stages, it can be concluded that organizational resilience is a multidimensional concept consisting of many capabilities (Duchek, 2020).

2.1.4. The Components of Organizational Resilience

Organizational resilience is the ability of organizations to survive, adapt, recover, and thrive in uncertain, unexpected, rapidly changing, or turbulent environments. The development of this multidimensional talent in organizations occurs at different levels and in different dimensions. Resilience develops in different dimensions in organizations, including individuals, teams and the entire organization, and also has cognitive, behavioral, and contextual dimensions (Ma et al., 2018).

Organizations can develop resilience, which can be called the resilience capacity of the organization, through three resilience components (Lengnick-Hall & Beck, 2005):

- 1) First, an organization can evaluate unfamiliar and different situations, which is its **cognitive resilience**.
- 2) Second, the organization can find new ways to confront these events through its **behavioral resilience**.
- 3) As a third, component, **contextual resilience** ensures the organization to mobilize resources and transform processes. Contextual resilience is social capital and resource network, and it combines cognitive and behavioral resilience by setting a framework of organizational and human relationships (Polyviou et al., 2020).

Accordingly, resilience in organizations is composed of these three resilience capabilities, namely, cognitive resilience, behavioral resilience, and contextual resilience that increase the ability of an organization to understand unexpected situations, develop necessary actions, and improve constructive sense making. Constructive sense making consists of the language of the organization to build up meaning, understand, and define situations (Lengnick-Hall et al., 2011).

The overall resilience strength or capacity of the organization is more than the sum of these three components. This is because these elements interact with a nonlinear pattern, and these interactions cannot be predicted with certainty. In addition, having one of these three factors perfect does not necessarily indicate high resilience. To reach high organizational resilience, all factors must be consistently good (Lengnick-Hall & Beck, 2005).

Organizational resilience is usually influenced by the characteristics of the individuals in the organization, and the resources, the structure, social networks, as well. Together with that, it is a result of the dynamic interplay of resilience at individual, group, and organizational levels (Van Der Vegt et al., 2015).

The existence of a favorable interaction between resilient individuals in the organization supports the increase resilience of the groups. Beyond this, organizational learning among groups and teams in the

organization having high resilience may also promote the increase resilience in the entire organization. As this dynamic process of interaction between the individual, the group and the team, and the entire organization continues, resilience at the organizational level is expected to increase and improve. In a sense, organizational resilience should not only be seen as a capability at the organizational level, but also as a capability that includes interactions at different levels. As a result, it is possible to define organizational resilience as a dynamic capability that has cognitive, perceptual, and contextual networks and can be strengthened by interactions between the individual and the entire organization (Ma et al., 2018).

Resilience is the capability of organizations to overcome unexpected situations by reconfiguring their resources in a flexible and transformative way. In resilient organizations, people can point out errors or the conditions that led to errors, and there is a belief that it is possible to deal with a wide range of risks by developing organizational capabilities.

When an organization successfully demonstrates resilience in the face of any challenge, there is a positive cycle in the organization's capabilities, strengthening its capabilities against a possible new challenge. In this context, resilience also includes organizational cognitive, behavioral, and contextual processes (Lengnick-Hall & Beck, 2005).

The perceptual or cognitive dimension, one of the dimensions of organizational resilience, is the capacity of organizations to perceive environmental changes and interpret situations that may develop suddenly and threaten the continuity of the organization. When the basic elements of cognitive resilience are considered, the purpose, vision, and core values of the organization can be mentioned. The cognitive dimension is how organizations recognize and analyze risks and prepare a collective mind for unexpected challenges.

The cognitive dimension consists of the identity of the organization and constructive sense making in the organization.

- **Organizational identity** is based on core values, a powerful sense of the organizational purpose, vision, and intentional use of the organizational language (Lengnick-Hall et al., 2011).
- **Constructive sense making** depends on the words, organizational language, images, and stories of an organization (Lengnick-Hall et al., 2011). The values and vision that shape identity of each organization and the sense-making elements that influence the organization's propensity for innovation and change.

The second component of organizational resilience, the behavioral resilience, includes **agility, learned resourcefulness, behavioral preparedness, and useful routines or habits**. These elements enable the

organizations to work. Behavioral resilience of the organization is the set of routines and behaviors that enable the organization to obtain more information about situations that change rapidly or have possible negative effects, to develop new behaviors, and beyond that, to use the resources in the organization under negative situations and develop new routines or procedures to adapt and thrive on unexpected challenges (Lengnick-Hall et al., 2011).

The third component of resilience in organizations, the contextual resilience, which consists **of social networks, resource stocks, supply lines, and interpersonal connections**, which provide the foundation for rapid action in uncertain, unexpected situations. Social capital and a wide network of resources are the essential factors of contextual resilience, referring to a social, and resource network prepared for dealing with challenging situations. Contextual resilience ensures the integration of behavioral and cognitive resilience and involves social capital and resource networks. Thus, through contextual resilience, both cognitive and behavioral resilience can be realized. The development of social capital develops through repeated interactions between individuals and organizations and is most effective when there is trust-based interaction between individuals (Lengnick-Hall & Beck, 2005).

The practices in the contextual resilience component of organizational resilience include training, staff retention policies, collaborative working, and resource networks. Resource networks can be developed through the expansion and intensity of interconnected relationships with external agents such as subsidiaries, customers, suppliers, and other organizations.

Regarding the different levels of resilience, these three dimensions develop in such a way that cognitive resilience ensures a critical source for developing behavioral resilience, and the individuals in the organization having behavioral resilience associate with other people to establish networks of social capital and other resources.

Consequently, organizational resilience emerges as a multi-dimensional and multi-level dynamic capability in organizations.

2.1.5. The Factors of Organizational Resilience

Several organizational capabilities are considered as factors of resilience in organizations. Drawing on the perspective of dynamic capabilities (Teece et al., 1997), proactive risk management, reconfiguration of resources, investing in risk-averting infrastructure, and disruption orientation are among the capabilities of organizations to maintain their resilience.

Hollnagel (2009) expressed the issue through addressing four main abilities that support and improve the resilience quality in organizations (Lee et al., 2013). These are the ability to find solutions to various

problems and respond to constant or sudden threats, to monitor what is happening around the environment, to predict disruptions, and to learn by drawing conclusions from experiences.

Lengnick-Hall et al. (2011) predict that resilience of organizations can be increased at two levels. The first is to increase knowledge, talent, and merit at the individual level. The second are processes that facilitate adaptation at the organizational level. These processes allow the determination to move forward and the establishment of an appropriate integration process to overcome a devastating shock. Foresight proves to be an important factor for such integration.

There are various perspectives on the concept of organizational resilience, and in this context, researchers have not reached a consensus on its definition. Organizational resilience is characterized in three dimensions as **awareness, adaptation capacity, and management of vulnerable areas** by several authors (Stephenson, 2010; Stephenson et al., 2010), in six dimensions as **critical understanding, role dependence, goal-oriented solution seeking, avoidance, resource dependence and access to resources** (Mallak, 1998), and four dimensions as **robustness, resource redundancy, resourcefulness, and rapidity** (Bruneau et al., 2003, Wicker et al, 2013). Based on these dimensions, Wicker et al. (2013) conceptualized organizational resilience as **robust, redundant, resourceful, and rapid functioning**.

- 1) **Robustness** is the first dimension of organizational resilience as conceptualized by Bruneau et al. (2003). Robustness can be described as the power or capability of an element to resist a certain level of strain or stress without losing its functions or without any deterioration (Bruneau et al., 2003). In short, resilience refers to the capability of an organization to resist stress without any loss in functioning.
- 2) **Redundancy** refers to the availability of substitutable elements, and reconfiguration of these elements to meet functional requirements in case of interruption or loss of functionality (Bruneau et al., 2003). Redundancy represents the ability of the organization ability to replace different resources to ensure continuous operation. Redundancy can be considered a critical capability of an organization, especially after disruptions when human, infrastructural, and financial resources need to be replaced.
- 3) **Resourcefulness**, the third factor of organizational resilience, is also defined as resource abundance. Resourcefulness is the ability to identify the problems faced by the organization and to mobilize resources when there are factors that may negatively affect the organization (Bruneau et al., 2003). Resources are critical to the resilience of organizations. This is because maintaining and improving organizational resilience depends on a process in which resources can be sustained. From this perspective, the resourcefulness dimension is likely to be considered as a priority or prerequisite for the other three dimensions (Vogus & Sutcliffe, 2007).

- 4) **Rapidity**, the fourth factor of organizational resilience, is defined as the ability of an organization to respond to the unexpected events, to meet priorities of the organization, and to succeed in purposes of the organizations on time to control losses and prevent potential coming disruptions (Bruneau et al., 2003).

In summary, an organization is considered resilient when it can mobilize a variety of resources (resourcefulness) and replace missing resources (redundancy) in a timely manner (responsiveness or rapidity) and be able to continue operations in crisis (robustness).

2.1.6. Theoretical Background of Organizational Resilience

Resilience is crucial for an organization to achieve success in disruptive, turbulent, uncertain times because it is the capacity to adapt to a wide range of challenging situations (McCan et al., 2009). Organizations must be flexible to cope with environmental pressures (Sanchez Garcia et al., 2020).

The resilience term was first introduced in the study of Holling (1973) with the title of “Resilience and Stability of Ecological Systems” which is related to ecology. In this definition, resilience is the capacity of a system to overcome and absorb adverse situations and persist.

Resilience is described as the capability of a system to resist stress, to remain flexible, and recover from an adverse situation (Van de Vegt et al., 2015). In this definition, the resilience of a system can clearly be understood by identifying the capacities and capabilities of parts of the system and examining the interaction among these parts and the environment as well.

The term resilience has been used differently depending on the field of research because the definitions are based on the perspective of each field. Therefore, the conceptualization of resilience differs from one another (Linnenluecke, 2017).

In the ecological perspective, organizations show adaptation through changing their processes and structures to improve during crises or disruptions (Bosher & Dainty, 2011; McManus et al., 2008). Improvement in the adaptability of the organizations helps development of responses on time to combat and overcome disruptions (Linnenluecke & Griffiths, 2011).

The engineering discipline discusses organizational resilience as systems with cause-and-effect relationships (Barasa et al., 2018). Organizations can quickly return to functional state by bouncing back (Darrow & Eseonu, 2016; Madni & Jackson, 2009).

Resilience concept has been addressed under several topics in the organizational theory such as high-reliability organizations, crisis management, and disaster management. In the organizational

management research, Meyer and Rowan (1977) introduced organizational flexibility, leading to further research in the field. Organizational resilience concept emphasized the progress and development of organizations by adding new capabilities during the challenging situations (Coutu, 2002; Lengnick-Hall et al., 2011; Weick, 1988).

Researchers have not come to a single and common definition to define organizational resilience, nevertheless, it is widely accepted that it is the ability of organizations to adapt, absorb, and benefit from unexpected adverse events caused by changes in its environment, which may pose a threat to the uninterrupted continuation of their activities (Bell, 2019; Linnenluecke, 2017; Williams et al., 2017).

The use of the concept of resilience in management sciences has been about risk management and high reliability organizations. Subsequently, the concept of resilience was also explained with other organizational topics such as learning and collective dynamics (Granig & Hilgarter, 2020).

In terms of conceptualization, organizational resilience relies on the **high reliability organizations theory** (Samba & Vera, 2013; Weick & Sutcliffe, 2007). Boin and Van Eeten (2013: 433) stated that resilient organizations should be highly reliable organizations and compiled the studies of Bourrier (2011) and Rochlin (1993) on the characteristics of highly reliable organizations. With this compilation, the resilient organizations have the following qualities:

- High technical ability at all levels of the organization,
- Clear awareness of key events that must be prevented before they occur,
- Detailed set of procedures and practices to avoid unfortunate events,
- Formal definition of roles, responsibilities, and reporting relationships that can convert into a team-oriented and decentralized structure for solving problems in emergency situations.

It is expressed as having a culture of reliability that instills values such as being attentive and careful, complying with procedures, and taking responsibility at the individual level regarding the establishment of security within the organization.

On theoretical basis, organizational resilience is a new approach based on the **contingency theory**. Organizational resilience demonstrates that organizations are required to develop new capabilities to overcome challenging conditions during unexpected conditions (Coutu, 2002; Weick, 1988), accordingly, organizational resilience can be most appropriately studied and represented by the **dynamic capabilities view**.

Organizations can maintain and improve their resilience in unexpected and uncertain situations and changing conditions by reconfiguring their resources and adapting them to environmental conditions.

These routines, behaviors, and strategies of the organizations are called the dynamic capabilities of the organization (Teece et al., 1997; Teece & Pisano, 1994).

The organization needs dynamic capabilities to restructure its resources and thus adapt to the changing environment. The dynamic capabilities view is defined as an ability of an organization to develop, use, and reconfigure capabilities to adapt and respond to the changing environments (Eisenhardt & Martin, 2000; Teece et al., 1997).

Dynamic capabilities manifest themselves in various situations such as developing digital capabilities and adding them to processes and technological integrations, reaching new resources and markets by using effective marketing capabilities, and establishing strategic alliances. Dynamic capabilities involve differentiation and restructuring of the organization's current capabilities. The dynamic capabilities view is useful to examine resilience of organizations and its antecedents.

The Dynamic capabilities view (DCV) was developed based on the **resource-based view** (RBV) and has been an increasingly essential issue in the strategic management field (Tan et al., 2010). Resource-based view explains why some organizations outperform compared to the others and discusses the resources that contribute to or enable an organization to success.

Through resource-based view, the capabilities of organizations can be defined which help the organizations to apply their resources in different environments and situations. Capability of an organization refers to the capacity to distribute its resources in combination and incorporate the processes and other intangible resources such as know-how and skills in its processes (Wang & Ahmed, 2007).

The issue emphasized by the resource-based view is that the success of an organization depends on its resources. In an environment of high change, the organization's resources can provide a temporary competitive advantage (Eisenhardt & Martin, 2000). Considering this situation, remaining resilient in changing conditions and maintaining competitive advantage depends on organizations reconfiguring their resources and adapting them to environmental conditions. These strategies and routines are called the dynamic capabilities of the organization (Teece et al., 1997; Teece & Pisano, 1994). Accordingly, an organization needs to reconfigure its resources constantly for the changing conditions to maintain its competitive advantage in volatile and changing environments (Vanpoucke et al., 2014). This resource configuration necessity indicates that organizations need dynamic capabilities to deal successfully with uncertain and changing environments.

Dynamic capabilities can also be defined as the abilities of an organization to take advantage of external and internal organizational expertise to use in changing environments. As result of this, organizations can become ready to develop combinations of these competencies (Teece et al., 1997). Therefore, the

capability of an organization to apply its competencies is key to understand the dynamic capabilities, which enable organization to transform its resources and abilities to survive in extreme conditions and maintain its competitive advantage.

Resources and capabilities are very important for organizations to build resilience (Annarelli & Nonino, 2016). Organization's flexibility and redundancy are also considered as capabilities that contribute to its resilience (Sheffi & Rice, 2005).

According to Daft and Weick (1984), organizations that are aware of their environment constantly and respond in a proactive manner to any potential disruptions and threatening events, and consequently manage the risks are more likely to be resilient than the passive organizations. Thus, proactive risk management is considered as one of the important factors of organizational resilience.

Configuration of resources which is one of the dynamic capabilities of an organization is crucial for the survival of organization and its high performance in changing business environments (Ambulkar et al., 2015). This is because organizations can mitigate the effects of shocks and disruptions through resource configurations. Thus, resource configuration is among the factors of organizational resilience.

2.1.7. The Concepts Related with Organizational Resilience

Despite emphasizing similar characteristics, the definitions of organizational resilience are different, yet there is no single definition or conceptualization of the organizational resilience concept. It is usually used to express several related concepts. Recovery, adaptability, flexibility, agility, robustness, and redundancy are some of these concepts.

Organizational adaptation is the adaptability of the organization to a changing environment, but it is not organizational resilience since does not refer to learning from and growing through unexpected challenges.

Organizational agility explains the capability of an organization to change and implement agile and dynamic movements quickly (McCann, 2004). This concept does not have the components of the ability to learn and develop while organizational resilience includes learning and developing of organizations when they face.

The concept of flexibility emphasizes that organizations change by adapting to environmental changes (Ghemawat & Sol, 1998). Compared to resilience, it does not include capabilities such as organizational development and learning.

Improvisation, in organizational terms, is the ability of the organization to respond to unexpected situations without making plans and to do so with its existing resources. With improvisation, organizations can return to their state before the unexpected situation (Tax & Brown, 1998). In short, improvisation is the ability to react in the absence of advance planning. On the other hand, the concept of organizational resilience refers to the ability to develop and become better than the previous situation. Woods (2015) draws attention to the difference between robustness and resilience. A robust organization absorbs disruptions but may not necessarily recover from disruptions as resilience does.

Redundancy can be defined as keeping some of the resources of the organization in reserve in case of any adverse situation that affects the organization (Sheffi & Rice, 2005). Redundancy is the capability of an organization to add functions to its system when other functions are negatively affected, while organizational resilience includes being affected from unexpected events that can cause a hit to functional capacity, but new capabilities are formed, again organizational redundancy does not capture the concept of organizational resilience completely. Redundancy refers to the ability of a system to continue to exist even if the functions of some parts of it are adversely affected.

Adaptability is the capacity of an organization to adapt to a changing environment and reestablish a state of adaptation. Recovery refers to the ability to return to baseline and original conditions. Robustness can be described as the ability to emerge from disruptive situations with minimal damage to the functional capabilities of an organization.

Unlike these concepts, resilience is defined as the ability of an organization to bounce back to its original functions and performance level, learn, and improve (Cunha et al., 2013).

Organizational resilience includes these concepts but differs from them in that it refers to the capability of an organization to return to its original level and grow beyond this level. Organizational resilience is considered as a dynamic capability that combines the mentioned concepts into a single concept.

2.1.7.1. Organizational Adaptation and Organizational Resilience

Adaptation in the organizational meaning is the capability of an organization to adjust itself and to react to changes in its environment. Through adaptation, organizations make innovative arrangements and optimization activities so that organizations can align with their environment and improve their performance. Adaptation as a concept is the sum of adaptability and adaptation capacity. Therefore, these two concepts need to be explained to understand the relationship of the concept with resilience.

According to Woods (2006), dealing with the subject from a technical perspective, resilience is much more than adaptability. Because even if it is sometimes slow and difficult every system adapts to

environment in some way, but resilience is not a characteristic that every system is able acquire. Resilience is a multidimensional concept that relates to how individuals and groups in the organization manage uncertainty. Organizations apply various methods when managing uncertainty. Increasing organizational learning and developing new skills for adaptation are among these methods (Lee et al., 2013).

Erol et al. (2010) also considered adaptation capacity as one of the factors that increase resilience. Vogus and Sutcliffe (2007), and Woods and Wreathall (2008) discuss about two types of capacity regarding adaptability. The first of these is the capacity of organizations to offer solutions to the problems they face and to recover themselves. This capacity is discussed within the scope of continuity and risk management in organization theory. The second is that organizations provide dynamic solutions to the problems they face by going beyond the existing structure, in a sense, developing new capabilities (Lee et al., 2013). In both studies, it was assumed that the second type of adaptive capacity pertains to resilience.

The differences between adaptability and organizational resilience can be summarized in three characteristics.

- Firstly, in organizational adaptability, the change is gradual, and events can be predicted in certain limits while in organizational resilience, the change is sudden, and events are unexpected.
- Secondly, in adaptability behavior, the organizations aim to increase their performance by reaching equilibrium by adapting to the environment, while organizational resilience implies the absorbing capability to sudden environmental changes and overcome their effects, and to be sustainable despite external difficulties.
- Regarding implementation, organizational adaptability includes incremental intervention, but sudden or non-routine intervention is seen in organizational resilience (Linnenluecke, et al., 2012).

Differences between adaptation and organizational resilience were evaluated regarding the nature of change, organizational purpose, and implementation. The nature of the change was discussed in terms of organizational purpose and implementation. While organizational adaptation may be sufficient in an environment with gradual change and predictable events, organizational resilience is needed in an environment with sudden changes and unexpected events. While adaptation to the environment is considered as an organizational goal, the goal in resilience is to overcome environmental changes. Finally, adaptation is achieved by incremental intervention over time, whereas resilience may require sudden interventions.

2.1.7.2. Organizational Flexibility and Organizational Resilience

In the general sense, flexibility is the ability to respond appropriately to changing environmental conditions. Flexibility throughout management and organization is the capability to comply with changing environmental conditions and stakeholders' expectations with minimum time and effort (Erol et al., 2010). When the concept of flexibility is examined in an organizational sense, it is explained as the capacity of an enterprise to organize its internal structures and processes in response to changing environmental conditions (Reed & Blunsdon, 1998).

According to another definition, organizational flexibility is the capability of the enterprise to make changes in a short time and at a proper cost (Ghemawat & Sol, 1998). With a similar approach, Erol, et al. (2010) explained the concept as the capability of a business to adapt to changing environmental conditions in a short time and effort, while in addition to the definition of Ghemawat and Sol (1998), they include the ability to respond to stakeholders' expectations in changing environmental conditions.

Although they contain some similar elements, there are certain features that distinguish resilience from flexibility and agility. First, organizational resilience thrives in uncertain, unexpected, and disruptive situations. On the other hand, organizational flexibility manifests itself through the strategic maneuverability of the organization in the face of any changing situation.

Another indicator of the difference between concepts is related to the adaptation or transformation approaches of organizations. While organizational resilience refers to a transformation from within the organization to the environment, which involves absorbing and renewing many negative situations; Flexibility expresses the need to adapt to environmental changes and requirements and reflects the transformation within the organization according to environmental conditions (Lengnick-Hall et al., 2011). Another difference is that the concept of organizational resilience is multidimensional.

Organizational resilience is expressed in many studies with dimensions as robustness, flexibility, adaptability, and agility. To put it in another way, organizational resilience is the combination of all these concepts and covers them all. However, concepts such as flexibility and agility are not considered multidimensional and do not have a broad meaning as the concept of resilience (Borekci et al., 2015).

2.1.7.3. Organizational Agility and Organizational Resilience

When the concept of agility is examined in an organizational context, Kidd (1994) explains agility as a rapid and proactive adaptation of an organization to unexpected and unforeseen changes (Sherehiy, Karwowski & Layer 2007). Organizational agility is interpreted as an organizational quality that enables

businesses to act quickly, decisively and efficiently, and to benefit from the advantages of change by anticipating possible changes and providing appropriate conditions for these changes. Organizational resilience, in its structure, includes elements of agility, and beyond that, it also refers to the ability to recover and develop while overcoming challenging situations. In this context, the concept of agility does not fully cover organizational resilience.

2.1.7.4. Crisis Management and Organizational Resilience

Organizational crisis management is a systematic initiative carried out together with external stakeholders to effectively cope with emerging crises or prevent possible crises before they start (Pearson & Clair, 1998). Organizational resilience was previously considered with relation to crisis management. In this approach, resilience was discussed as a concept that anticipated what organizations must do in times of crisis. Nonetheless, the organizational resilience concept is used today to mean surviving and being more prospering despite the disruptive situations (Lee et al., 2013).

Compared to organizational resilience, crisis management has a narrower scope than resilience because it provides short-term solutions to get the organization out of a crisis and can partially ignore the before and after by focusing only on the current situation. Organizational resilience, on the other hand, is a more comprehensive concept than crisis management in terms of taking precautions in advance to prevent the organization from experiencing any crisis, turning it into an opportunity, focusing on the long term, and offering solutions by taking many variables into consideration. Another difference between crisis management and organizational resilience relates to their focus. While profit-oriented activities are focused on crisis management and programs to ensure the continuity of organizations, social and cultural factors are taken into account when it comes to resilience. These factors are difficult to directly correlate and measure with financial outcomes (Lee et al., 2013).

2.1.7.5. Risk Management and Organizational Resilience

Risk management is a systematic procedure in which risks are defined and evaluated, and methods to be followed in managing these risks are selected, developed, and implemented. In traditional risk management systems, institutional risks are classified as operational risks, market risks, financial risks, and market risks, and appropriate risk management systems are developed (Dionne, 2013).

Organizational resilience is broader than the scope of risk management, covering not only traditional risks such as financial risks, natural disasters, physical security, legal competencies, but also risks related to innovation, intellectual property rights and even partnerships and mergers. With organizational

resilience, an early warning capability is provided throughout the organization through the process of identifying risks, reporting information, managing information through business plans and strategic plans, and integrating this capability into daily operation and organizational culture (Braes & Brooks, 2010).

According to Park et al. (2013), while risk management is a practice related to preserving the current situation, that is, keeping the risk of failure to a minimum by avoiding transformational changes, organizational resilience is a practice that includes transformational changes and aims to minimize the consequences of failures rather than avoiding them. In this context, while preserving the status of organizations through strategies such as protection, backup and abstraction in risk management; in organizational resilience, organizations can be moved forward from their current situation with strategies such as compatibility, flexibility, innovation, and transformation.

While risk management covers strategies related only to the threat and danger elements of the organization, organizational resilience also evaluates strategic elements related to the opportunities and possibilities related to the organization.

2.1.8. The Approaches to Organizational Resilience

In existing studies in the literature, organizational resilience has been evaluated from dynamic and static perspectives. According to the dynamic view, the concept has been discussed in terms of capability and process, and according to the static view, it has been examined regarding its functions and results. Researchers adopting the process and capability view consider organizational resilience as a flexible and dynamic capability derived from the anticipating ability, adaptability, coping and learning ability, and survival capability that organizations possess in response to unexpected events.

Authors from a functional view consider organizational resilience as an ability of an organization to align with complex and dynamic environments, while researchers from an outcome approach view organizational resilience as the capability of organizations to maintain adaptability positively in the face of crises.

Generally, regarding to the organizational resilience concept, five different approaches have been discussed. According to Chan (2011). These approaches can be named as behavioral approach, intuitive approach, risk management approach, renewal process approach, and system approach.

The behavioral approach asserts that a resilient organization can implement accepted behavioral patterns and has the capacity to anticipate changes in the environment and immediately implement behaviors appropriate to these changes. In this context, according to the behavioral approach, to understand

organizational resilience, the behavioral patterns, processes, and principles in question should be examined.

There are studies examining behavioral patterns under seven headings (Horne & Orr, 1998, Mallak, 1998a) and five headings (Weick, et al., 1999).

Horne and Orr (1998) stated that there are seven behavioral patterns that make a significant contribution to the improvement of organizational resilience in an organization, and that these behaviors are exhibited intertwined and together to create the response of the entire system when significant changes occur in the environment of a business.

- The first of these behavioral patterns is the pattern related to the consciousness of the community that constitutes the organization, called community by the authors. This pattern expresses that the individuals in the organization have and internalize the mission, vision, and business values of the business. At the same time, this pattern reflects the degree to which the personal interests of the individuals in the organization coincide with the interests of the business.
- The second behavioral pattern, called competence, is explained as the harmony between the changes experienced in a business and the knowledge and skills that can meet the needs of the environment during periods of stress due to these changes, and the activities of the organization and the individuals and groups that make up the organization.
- The third behavioral pattern, called connections, is defined as the characteristics of the relationships between the systems that create the capacity and resilience of the organization that makes up a business and the individuals and groups that make up the organization to respond under changing conditions and pressure due to change.
- The fourth behavioral pattern, commitment, is defined as an ability of an organization to work together to maintain trust and goodwill in times of change and uncertainty.
- The fifth behavioral pattern, called communication, focuses on how a business shares its activities and where the business is heading. Communication has a key function in terms of resilience, mediating the connection of business-related systems.
- The sixth behavioral pattern that contributes to the development of organizational resilience is called coordination. Coordination is the linking of efforts to achieve effective results, ensuring organizational harmony within the business and uniting the organization for a common purpose.

- The last of the behavioral patterns mentioned is called keeping in mind. This behavioral pattern is related to how a business evaluates the individuals in the organization.

Weick et al. (1999) examined the behavioral processes that affect organizational resilience under five headings and stated that these five processes contribute to the formation of awareness of an organization and with this contribution, they create an infrastructure for events that require organizational resilience. The five processes mentioned are named as psychological preparation against possible disruptions due to the change, avoiding simplifying important explanations in order not to miss details, showing sensitivity to all processes, taking responsibility for resilience and determining the deficiencies of the structures.

Mallak (1998a) examined the behavioral principles necessary to ensure organizational resilience in a business under seven headings. The author is of the opinion that these principles will help take concrete steps in the progress of improving the organizational resilience of an organization.

- The first of these behavioral principles is called the perception of constructive experiences. This principle states that a business must have experience, even if it causes difficulties, and move forward in the light of this experience.
- The second principle, called the realization of positive adaptive behaviors, is explained as a business exhibiting behaviors appropriate to change, rather than exhibiting programmed behaviors during change.
- The third principle is named as providing sufficient external resources. This principle is expressed as providing sufficient external resources to enable a business to respond appropriately to different changes it may encounter.
- The fourth principle, called expanding the boundaries of decision-making, is explained as providing the decision-making authority needed to respond to the change experienced by a business and to ensure the use of the required resources.
- The fifth of the behavioral principles required to ensure organizational resilience is called the capability to combine different parts and form something new. According to this principle, a business should develop its ability to produce solutions for the changes experienced by using the available opportunities.
- The sixth of the mentioned principles is called developing tolerance for uncertainty. This principle is explained as improving the ability to make decisions with less than the amount of information requested.

- The last principle on the subject is called the creation of virtual role systems. This principle is explained as the ability of the individuals who make up the organization to fill every area needed within the framework of the mission of the business in case of change in a business.

The intuitive approach suggests that resilient organizations can understand possible changes, problems, and threats before the unexpected and changing events. In this approach, prior understanding ability and awareness form the basis of the approach (Chan, 2011).

In the existing literature, organizational resilience is discussed within the scope of the intuitive approach in the studies of Weick (1993) and Issel and Narasimha (2007). Weick (1993) is of the opinion that if the intuitions that can be experienced in an organization decrease, are lost or deteriorate, the resilience of the organization will decrease, and the fragility will increase in case of unexpected changes. It is predicted that the organization may face negative consequences if organizational resilience decreases, and fragility increases due to the mentioned reasons.

Weick (1993) emphasizes that the ability to combine different parts and create something new, the creation of virtual role systems, astute attitude, and respectful interaction will increase organizational resilience.

In the study of Issel and Narasimha (2007), organizational resilience was examined on the axis of organizational awareness within the scope of the intuitive approach. Within the scope of the study, it is emphasized that organizational awareness must be created to ensure organizational resilience. Organizational awareness in the face of an unexpected situation requires to development of the ability to take responsibility for resilience, adapt, and compensate for mistakes in the organization.

The risk management approach supporters define organizational resilience as the organizational capacity developed against unpredictable and destructive changes (Chan, 2011). In the literature, Comfort (1994) and Sheridan (2008) discussed organizational resilience within the scope of the risk management approach.

Comfort (1994) examined the relationship between foresight and resilience. The author focused on reducing risk, discussed risk management plans, and stated that the mentioned plans are one of the most important factors that prevent chaos and confusion from occurring in a crisis. The author emphasized that the mentioned plans are effective on foresight and resilience ability, thus reducing chaos and confusion and that continuous learning must be developed for the mentioned process to develop.

Sheridan (2008) stated that analyzes related to risk management are carried out based on past events and the risk method is planned through these analyses. However, according to the author, conducting the analyses using these method causes the validity of these analyzes to be questioned. Because there is a

possibility that human errors in analyzes and errors in past events may be different from the current event. For this reason, Sheridan (2008) suggests that the organizational resilience concept is more than risk management. According to the author, organizational resilience contributes to risk reduction by providing more useful and valid analyzes regarding organizational processes and activities carried out.

Regarding the perspective of the system approach, there are various studies in the literature that discuss organizational resilience (Helbing, et al., 2006; Ignatiadis & Nandhakumar, 2007; Riolli & Savicki, 2003).

Riolli and Savicki (2003) stated that organizational resilience consists of community, communication, responsibility, connections, capability, consideration, and coordination factors. According to the authors, these factors are effective in the relationship of the individuals who make up the organization with the environment, and this effect plays a role in the formation of organizational resilience. However, factors related to the external environment are also effective in increasing the organizational resilience. On the other hand, it was stated that the processes and structure of the organization and the culture it has developed are the most significant factors of resilience in organizations.

Helbing et al. (2006) stated that a business should establish a broad network system to overcome unexpected changes and improve its organizational resilience to these changes. It is argued that businesses can provide support in times of change with the mentioned network systems and thus save time and overcome the negativities experienced due to changes.

Ignatiadis and Nandhakumar (2007) suggested that developing corporate systems for a business would facilitate seamless integration and data exchange between organizational departments. For the business to develop enterprise systems, it is necessary to have strictly defined control mechanisms that protect data and prevent unauthorized use of data. The authors stated that the development of the mentioned institutional systems will increase organizational resilience, however, failure to develop the mentioned systems correctly will cause decreases in organizational resilience.

According to the renewal process approach, an organization with organizational resilience is an organization that can renew itself after the change to ensure the effectiveness of the adaptation process to the changing environment. Studies conducted on this approach focus on early warning systems and innovation that may hinder the renewal process (Valikangas, Hoegl & Gibbert, 2009).

In the existing literature, there are several studies that discuss organizational resilience within the scope of the renewal process approach (Reinmoeller & Van Baardwijk, 2005); Cho et al., 2007).

Reinmoeller and Van Baardwijk (2005) examined the contributions of innovation strategies developed by businesses on organizational resilience. Within the scope of the study, which innovation strategies

preferred by organizations with organizational resilience and what kind of innovations they realized within the scope of these strategies were discussed. The study emphasized that businesses can choose four different innovation strategies, but focusing on a single strategy will not have an impact on organizational resilience. It was stated that, instead of focusing on a single strategy, businesses would increase organizational resilience if they use the applications of four strategies in balance in situations of change, appropriate to changing environmental conditions. However, it is predicted that leaders' ability to focus on the mentioned strategies will also contribute to the development of organizational resilience.

Cho et al. (2007) examined the relationship between the adaptation process to innovations in a business and organizational resilience. The study emphasized that although businesses have clearly developed organizational resilience, innovations continue to remain in a fragile structure. While organizational resilience ensures rapid and successful adoption of innovations, it is also predicted that it may endanger the sustainability of innovation in the long term.

2.1.9. The Antecedents of Organizational Resilience

Various concepts have been mentioned as antecedents of organizational resilience in the literature. The resources that form the basis of flexibility of an organization have been stated as one of these antecedents, as they strengthen its problem-solving competence (Lengnick-Hall & Beck, 2005; Linnenluecke & Griffiths, 2012).

Pal et al. (2014) argued that the organization's physical resources, financial resources, social resources such as qualified employees, network resources and intangible resources, dynamic competitiveness, individual and organizational learning and corporate culture are effective in increasing organizational resilience.

From another point of view, Koçel (2015) suggested that awareness and being prepared for possible dangerous situations increases the resilience of the organizations.

Burnard and Bhamra (2011) and Stephenson (2010) discussed that innovations are one of the sources of the organizational resilience. Similarly, Reinmoeller and van Baardwijk (2005) stated that innovative organizations possess higher resilience capacity than the organizations with less innovation. These innovative organizations can have and sustain competitive advantage, and consequently their resilience improves (Carvalho et al., 2016; Hamel & Välikangas, 2003).

In organizations, the networks have a significant role in knowledge sharing and enhancing collective responses to adverse events (Lengnick-Hall & Beck, 2005; Stephenson, 2010), some authors discuss the

importance of networks outside the organization for improvement of resilience (Lengnick-Hall & Beck, 2005; McCann & Selsky, 2012). Networks, as one of the relational sources of an organization, enable organizations to be more resilient (Kahn et al., 2013; Vogus & Sutcliffe, 2007).

According to Menendez and Montes (2006), various factors enable organizations to be resilient. An empirical study based on this theoretical framework has revealed that human capital has an important role in improving the adaptability and therefore resilience of the organization through training, talent development, changing human resources structure, and research and development.

Although there are theoretical and conceptual studies on organizational resilience, it should be noted that empirical studies are few and open to empirical studies on how to increase it.

According to Mallak (1998), the resilience of the individuals within the organization is the driver of the resilience of the entire organization (Riollia & Savicki, 2003). Researchers consider individual resilience as a personality propensity and explain it with characteristics such as self-sufficiency, and tolerance (Kimhi & Eshel, 2009).

Fraser et al. (1999) discussed that resilience of individuals in the organization is initiator for the resilience in the organization. Individual resilience refers to being able to adapt to extraordinary events and the unexpected outcomes of these events and remaining affirmative in the face of them.

The basic logic behind seeing individual resilience as the initiator for the organizational resilience is based the fact that a collective capability for organizational resilience is established through the interactions among the individuals. The connection between resilience in individual level and in organizational level is similar to the relationship between systems and subsystems (Mallak, 1998; Lengnick-Hall et al., 2011).

According to Horne and Orr (1998), resilience at the individual level does not guarantee resilience at the organizational level. In fact, in some organizations, resilient individuals can even create a counterproductive effect. When the influence of strong and resilient individuals on others is intense, the vision of individuals may dominate instead of a shared vision within the organization.

According to Pal et al. (2014), compared to the larger organizations, small-medium scaled organizations are more likely to be influenced by the environmental changes, the fluctuations, changes in demands of the customers, and economic and financial turmoil, and legal changes as well. Accordingly, one of the factors considered, as an antecedent for the resilience of the organizations is the size of the organization.

2.2. Digital Transformation

In this part, the definition of digital transformation, the digital transformation implementations in the healthcare industry, and digital transformation in healthcare industry in Türkiye are discussed.

2.2.1. Definition of Digital Transformation

The concept of digitalization refers to the change of a processes, behaviors, and corporate culture of an organization by using digital technologies. The digitalization concept can also be defined as all social and technical phenomena and processes related to the utilization and adoption of digital technologies in broader contexts, in other words, at the individual level, organizational level and society level (Brennen & Kreiss, 2016; Legner et al., 2017).

From a historical perspective, the beginning of digitalization began in the 1980s with the widespread use of computers instead of paper as the carrier of information. As a second wave, with the use of the internet in the historical process, the transformation of communication channels, commerce, and services into digital-based models has occurred. The third wave of digitalization can be considered as the spread of mobile internet, which allows people to access the internet regardless of their location. In the last wave, the use of new digital technologies has been started to be used which can be defined under the name Industry 4.0 (Davidsson et al. 2016; Legner et al. 2017).

With the rapid development of various digital technologies, significant changes are taking place in the economies of societies. Many digital innovations including artificial intelligence, industrial internet, cloud computing, big data, and blockchain have become inevitable mechanisms for organizations to continue their activities successfully (Vial, 2019).

Especially with the effect of the COVID-19 pandemic, digitalization has been considered as beneficial to organizations in terms of productivity increase, resource allocation, and social coordination and is important for the improvement of the activities of organizations. The importance of this situation is also clear in terms of the impacts of digital transformation on the resilience of organizations. Resilient organizations provide situation-specific responses to disruptive events that threaten their operations and survival and are ultimately able to undertake transformative activities (Lengnick-Hall & Lengnick-Hall, 2011, Williams et al., 2017).

Recent research has discussed how digital transformation will restructure the original capabilities of organizations and enable the emergence of corporate versatile dynamic capability (Rialti et al., 2017; Scuotto et al., 2019).

Digital transformation is considered as a driver that enables the emergence of dynamic capabilities in the organization according to the dynamic capabilities view (Warner & Wager, 2019). In this context, digital transformation is considered as an innovation process that enables the restructuring of internal and external resources, structures, and processes in the organization and the creation of corporate integration.

Digital transformation can be defined as a continuing process that aims to improve a society or industry by significantly changing its characteristics with computing, communication, and information technologies (Vial, 2019).

However, far beyond the use of new technologies, digital transformation is also defined as a dynamic and continuous process in which the technological facilities of the organization are used in a way that affects and transforms the organization's processes, business models, workforce, and entire culture (Kane et al., 2017).

The definitions of digital transformation vary, and there has been no generally agreed definition of the concept of digital transformation (Schallmo et al., 2017). The “transformation” word in the concept refers to a significant change within the organization that has effects on its structure, power distribution, and strategy (Matt et al., 2015).

Digital transformation is the use of new digital technologies, such as mobile technologies, social media, and analytics or embedded devices, to enable significant organizational improvements such as improved operational processes, and customer experiences.

Digital transformation can shortly be defined as the utilization of technology to improve the performance of organizations. The use of digital technologies such as embedded or mobile devices to realize major developments in the activities of organizations (Fitzgerald et al., 2014).

Piccinici et al. (2018) emphasized that digital transformation includes using digital technologies to allow organizations to realize significant developments, to exemplify, new business models.

In another definition, digital transformation is considered as the change in physical offerings (i.e., products and services) of the organizations into a digitization process and organizational changes which are induced by data-driven insights (Horlach et al., 2017).

Legner et al. (2017) discussed that through digital transformation concept, it is implied that the organizations change their business in a way that Information Technologies (IT) is used to automatize tasks within the organization.

Digital transformation is viewed as the implementation of digital technologies and compliance with the significantly changing digital environment to fulfill the digital expectations of all stakeholders, employees, customers, and shareholders in the organization (Berghaus & Back, 2016; Kane et al., 2017).

Digital transformation is also viewed as the total impact of using digital technologies and its transformative effects on a particular field (Faddis, 2018).

Henriette et al. (2016) stated that the acceptance of digital transformation varies among practitioners and researchers, and that it is still a variable concept. In their systematic studies in this direction, they stated that digitalization represents strategic, organizational, and cultural interests for the organization and requires the commitment and participation of top management.

Hinings et al. (2018) stated that digital transformation is the whole of all digital innovations that change or complement existing structures and practices in an organization or industry and introduce new values and practices.

What is meant by the word "digital", can be expressed in detail as optimizing the processes that directly have impacts on the customers' experiences, forming main capabilities that support the whole business structure by applying technology to business processes, and adding value in the changing new framework of the business world. In this definition, it is emphasized that digital technologies add additional value both for the organization itself and for its important stakeholders such as customers, employees, and partners (Schallmo et al., 2017).

Morakanyane et al. (2017) compared various definitions of digital transformation in their study, as a result, according to a common understanding emerging from these conceptualizations, digital transformation emerges as a dynamic process that uses digital technologies and digital capabilities to improve and add value to business processes, models, and customer experiences in the organization.

Ebert & Duarte (2018) stated that the widespread implementation of digital transformation would deeply affect the business environment. The authors divided the impacts of digital transformation into two and expressed them as social impacts and economic objectives. These social and economic impacts are related with the innovativeness brought by digital transformation.

In the social dimension, it is aimed with digital transformation to develop a more innovative culture both in the industry and in society in general in a way that will add new capabilities to people.

In economic terms, the aim is to increase productivity and contribute to the economy by introducing innovative business models through digital transformation.

2.2.2. Digital Transformation in the Healthcare Industry

Digital transformation has effects on every sector, and healthcare industry as well (Ricciardi et al., 2019). The organizations that do not digitalize, do not integrate Information and Communication Technologies (ICT) within their corporate activities, and do not integrate digital transformation into their business processes at the right time are prone to significant risks in their activities. Digital transformation in the healthcare industry is the adoption and utilization of the latest digital technologies in healthcare systems. The arrival of the digital age and the usage of digital tools and applications in the healthcare systems is an important turning point for the healthcare industry. In healthcare, digital transformation has reshaped how patient services are delivered and managed, the treatment experiences of patients, and fundamental aspects of the healthcare system. A wide variety of applications, such as artificial intelligence-supported diagnostic methods, data analytics, telemedicine applications, and the use of robotic technologies, have enabled the restructuring and radical change of operations in healthcare institutions. Service organizations are changing the way they conduct their operations by engaging with digital transformation and incorporating it into their processes and integrating it into every aspect of their operations. For instance, the use of robotic technologies and artificial intelligence has fundamentally changed customer relations with service providers and the way of delivering service (McCartney & McCartney, 2020).

The use of electronic health (e-health) expressions is increasing in the digitalization of health services (Scarpato et al. (2017). The importance of change in e-health is increasing day by day in the improvement and development of health systems and in providing them uninterruptedly (Coşkun, 2018). Electronic health services, in other words, information and communication technologies that facilitate health services are becoming increasingly widespread (Mars et al., 2010). The term e-health, which emerged in the early 2000s, includes the use of electronic information and communication technologies in the healthcare industry (Harrison & Lee, 2006).

The use of digital technologies in the field of healthcare can have many positive effects on improving existing activities, such as supporting business structures, systems and processes, and increasing efficiency (Kraus et al., 2021).

Digital transformation in healthcare services refers to processes that enable the use of technologies such as hospital information systems and databases, keeping electronic records, health-related digital applications, electronic health services, and a wide range of health applications (Belliger & Krieger, 2018).

Haggerty (2017) emphasizes that digital transformation services in health include digital imaging systems, enterprise resource planning systems, e-prescription services, electronic health records and applications, as well as many digital applications integrated into information technologies.

The main applications regarding the utilization of digital technologies in the field of healthcare are as follows:

- **E-health:** Services where healthcare services are supported by information and communication technologies (Ventola, 2014).
- **Electronic Health Record (EHR):** An information repository that allows medical data to be collected in a computer environment and used when necessary (Baird, Davidson & Mathiassen, 2017).
- **Clinical Decision Support Systems:** Computer programs that assist healthcare professionals in clinical decision-making for the purpose of improving healthcare (Arts et al., 2018).
- **Tele-medicine:** Information and communication technologies utilization by all healthcare professionals in the delivery of health services, to ensure the sharing of information necessary to improve individuals' health, to diagnose, treat and prevent diseases or injuries, and to continue research and evaluation in terms of continuing education of health service providers (WHO, 2010).
- **Mobile Medicine:** Clinical applications where medical data is transmitted over the Internet or other networks for consultation or remote review (Ventola, 2014).
- **Patient Imaging and Tracking Systems:** Systems where vital signs of patients such as heart rate, blood pressure, respiratory rate, and body temperature are monitored (Khajouei & Abbasi, 2017).
- **Mobile health:** The healthcare applications used by the public which are available on mobile phones, personal digital healthcare assistants, and other monitoring tools in applications (WHO, 2014).
- **Smart Card Applications:** Portable integrated devices with data storage and processing features in information technologies (Kardas & Tunali, 2006).
- **Radiology Information Systems:** Systems that enable the storage of medical images (Samaan, 2017).
- **Nursing Information Systems:** Systems that support the duties of nurses, increase the quality of nursing care and the efficiency of nurses' information management, and enable clinical information sharing between nurses and other health professionals (Lin et al., 2016).
- **Hospital Information Management System:** Information systems that collect, store and distribute information regarding the planning, control, coordination, analysis and decision-

making processes that are the management functions of health institutions (Chatterji et al., 2017).

Healthcare Information and Management Systems Society (HIMSS) is a globally recognized non-profit institution established to develop information and communication technologies and ensure their high-level use in the provision of healthcare services. Evaluation of the digitalization levels of hospitals around the world is carried out by HIMSS. HIMSS analyzes and accredits hospitals through the concept of digitality, using the Electronic Medical Records Adoption Model (EMRAM) scoring, from one to seven (Ayat & Sharifi, 2016).

2.2.2.1. Digital Transformation in Healthcare Industry in Türkiye

In today's business world, where global developments are rapid, developments in the field of digital transformation seem to be a necessity for organizations. In this context, the importance of the service sector, and especially the healthcare sector, adapting to digital transformation is emphasized for both researchers and practitioners.

The most systematic of the developments and steps taken in the field of digital transformation in Türkiye was the e-Transformation Türkiye Project put forward in 2003. The Access to Information Law in 2003, the Law of Electronic Signature enacted in 2004, the Universal Service Law in 2005, the Information Society Strategy in 2006, and the e-Government Gateway Project in the same year (see: www.turkiye.gov.tr), as well as the e-Transformation Türkiye Project (Çetiner, 2009).

Transformation in health has been a priority area in Türkiye since 2002. The relevant project, various pilot applications that were carried out at selected pilot points throughout the country until 2013, were completed in 2013, and the studies were put into practice (Coşkun, 2018).

Over the past twenty years, Türkiye has been following the developments in information technologies and innovations in the healthcare industry, as in many other sectors. The usage area of electronic health services is very wide. E-health applications accepted in the world can be grouped under the following headings: Tele-medicine, tele-radiology, tele-psychiatry, tele-dermatology, tele-pathology, home health care, tele-dentistry, and tele-surgery are some of the fields with the most application opportunities (Işık et al., 2013).

There have been many digital transformations within the healthcare system of Türkiye over the past two decades. Thanks to e-government services, especially the e-pulse application, many services have become easily accessible to citizens over the Internet. In the rapid development and transformation of the healthcare system in Türkiye after the 2000s; almost all health records have been transferred to

digital media, and rapid progress has been made in the areas of data exchange and common use of data. Many systems developed by the Ministry of Health including the Central Physician Appointment System (MHRS), tele-radiology, and e-pulse, are already actively used (Altıntaş, 2022).

Various e-health applications are available that are carried out within the program of the digital transformation in health in Türkiye (Ülke & Atilla, 2020). Tele-medicine systems, Electronic Medula System, Electronic Prescription (e-prescription) System, Electronic Pulse (e-nabız) Application, Central Hospital Appointment System (MHRS), Electronic Document Management System, Sağlık Net, Ministry of Health Communication Center (SABİM) are among these e-health applications. There are also health practices and systems in the sub-fields of these applications. Special reporting screens only for hospital managers or higher managers, and various applications created in line with periodic needs can be given as examples of these systems.

In the 2024-2028 strategic plan of the Ministry of Health, it is aimed to ensure the effective and efficient use of digital health solutions within the health system, to expand the utilization of digital healthcare technologies, to provide an effective integration of digital health solutions with the health system, to support the digitalization infrastructure of hospitals, and to ensure the utilization of digital technologies in the field of health, and to raise awareness throughout the society and also to improve digital health literacy.

2.3. Intellectual Capital

Intellectual capital definition, the theoretical background, and the factors intellectual capital are presented in this part.

2.3.1. Intellectual Capital and Theoretical Background

The concept of intellectual capital was introduced by J. Kenneth Galbraith in 1969, with his ideas arguing that intellectual capital is not only a product of human intelligence but also a set of intellectual activities (İpçioğlu, 2008).

Galbraith discussed intellectual accumulation and related this concept to individual performance. According to Galbraith, intellectual capital has been defined as integrated activities with intellectual equipment rather than seeing it as a phenomenon resulting from the pure intelligence of individuals involved in organizations (Pena, 2002).

Despite the widespread use of intellectual capital in the literature, it was not a popular field before the mid-1990s. Since the mid-1990s, it has attracted the attention of both researchers and practitioners and has become popular. The concept of intellectual capital, in its current sense, first attracted attention with the article titled "Brain Power" published by Stewart in Fortune magazine in 1991 (Bontis, 1999).

At the beginning, when the intellectual capital concept became popular, it was considered as a hidden asset of an organization and represented the difference between the book value and the market value of an organization (Stewart, 1994).

Intellectual capital is the information value of an organization or the recorded information that an organization has as intangible and invisible assets and the knowledge, experiences, and skills of the employees in an organization (Büyüközkan, 2002).

Umer et al. (2014) described intellectual capital as all the factors in an organization that include knowledge, skills, and experience that have a significant impact on the existing and future development of the organization, and intangible assets such as patent information systems, licenses, agreements and copyrights as well. From this definition, it can be said that intellectual capital is an intangible asset that are an important factor for the organizations to achieve a competitive advantage.

Intellectual capital is also defined as the total of all knowledge of the individuals that play a very important role in organizations achieving competitive advantage (Nahapiet & Ghoshal, 1998; Stewart & Ruckdeschel, 1998; Teece, 2000).

Intellectual capital, in a comprehensive definition, refers to knowledge, information, intellectual property, and experience. Intellectual capital is the sum of all things known by people in an organization and gives it a competitive advantage (Stewart, 1997).

The conceptualization of intellectual capital by Bontis and Chua (2019) points out that intellectual capital is the intangible assets that are not reflected in the financial statements of an organization, however, have a significant impact on the value of the organization, and its performance as well.

Chen (2008) defined intellectual capital as the total knowledge, abilities, and assets that contribute greatly to an organization achieving the highest results it desires and that make it superior in the competitive field and are not easily seen if not carefully monitored and followed.

The definition of intellectual capital on which researchers agree is that intellectual capital consists of not only individual but also organizational resources and is a non-physical asset that is not specified as monetary value, but is held by information in business processes, and in the systems and databases of the organizations. With these characteristics, intellectual capital is considered to contribute to the value of the organization (Serenko & Bontis, 2004; Thrylo & Kornukh, 2011; Zharinova, 2011).

2.3.2. The Factors of Intellectual Capital

The elements or factors of intellectual capital were in focus of many researchers. In the previous studies, it is seen that intellectual capital was examined in different dimensions. Spender (1996) discussed that intellectual capital comprises individual or social knowledge and explicit or tacit knowledge. This categorization results in two dimensions and four elements.

Two main factors of intellectual capital are suggested to be human capital and structural capital in the categorization of Edvinsson and Malone (1997). The authors further categorized structural capital into two sub-categories as customer capital and organizational capital.

According to Sveiby (1998), intellectual capital has three elements as internal structure, external structure, and individual experience.

Johannessen et al. (2005) suggested that intellectual capital has four factors, which are human capital, system capital, structural capital, and network capital.

Based on all these categorizations of intellectual capital elements, the three primary factors of intellectual capital that are most commonly accepted are human capital, relational capital, and structural capital (Chen, 2008; Chu et al., 2006; Hsu and Fang, 2009; Shih et al., 2010; Vergauwen et al., 2007).

Most of the researchers who study intellectual capital believe that intellectual capital is formed with these three elements. Thus, the three building blocks of the intellectual capital are widely used in the existing literature are human capital, customer or relational capital, and structural capital (Ghosh & Wu, 2007). This categorization of intellectual capital based on three components appears as an emerging standard of the phenomena (Inkinen, 2015).

2.3.2.1. Human Capital

Human capital is the human-based resources of the organization, which consists of knowledge, skills, expertise, abilities, innovativeness, commitment, attitude, wisdom, and motivation of the individuals within the organization (Bontis et al., 2007; Inkinen, 2015; Inkinen et al., 2017; Sveiby, 2019). It can be considered as the knowledge stock of an organization.

The critical role of human capital in an organization stems from the fact that the knowledge and expertise that will enable the organization to develop, innovate, and grow depends on talented employees who have this expertise and knowledge (Li & Guo, 2020). Experienced, highly trained, competent, and motivated employees may question the existing established routines and procedures of the organizations. This yields the formation of new knowledge and supports the learning process, and innovations in the

organization (Weggeman, 1997). Studies have shown that investments in human capital have positive effects on organizational performance, and the financial results of organizations (Huang & Chen, 2020).

2.3.2.2. Structural Capital

Structural capital, also called non-human structural capital, is a concept that refers to all processes, routines, databases, procedures, systems, images, trademarks, patents, copyrights, software, hardware, intellectual property, and information systems in the organizations (Bontis & Chua, 2019). These are strategic assets of the organization. In this context, trade, brands, patents, and other special assets used by the organization to develop and add value, and moreover to support its activities, can be considered as structural capital.

Structural capital can be improved by increasing the research and development activities of the organization, investing in technological fields, and investing in organization that will increase the level of learning in the organization. Structural capital includes the organizational factors that promote human capital and relational capital (Inkinen, 2015).

Structural capital of an organization can also be defined through eight sub-components as follows (Emrem, 2004).

- 1) **Organization culture:** The only thing that cannot be imitated by a business is its corporate culture, which provides a competitive advantage to the organization.
- 2) **Corporate image and identity:** Corporate image is the image of the business culture reflected or reflected outside the organization. Corporate identity is how the institution is physically recognized.
- 3) **Brand:** A strong brand is an important intellectual asset for managers and investors, as customers' value and prefer a strong brand more.
- 4) **Information technology:** Information technology is an organization's investment in computer and communications technology.
- 5) **Research and development:** R&D is the transformation process with the highest added value in which knowledge turns into concrete products. It covers activities such as competence development, product development, improvement in the processes, expansion in the existing business, establishment of new business, and innovation.
- 6) **Intellectual property:** Intellectual property is legally protected intellectual assets and refers to the ownership rights of important information assets owned by businesses. While these assets must have an economic value to be considered intellectual capital, it is known that companies today have many patent rights that do not have economic value.

- 7) **Process:** To be considered an intellectual capital element, it must have intangible features that will add value for the business and differentiate it from other competitors. Since the information infrastructure must be used efficiently to add value, it must be evaluated with information technology.
- 8) **Social responsibility:** Activities carried out on social issues are welcomed by the society and provide added value to businesses even if they are for social purposes.

2.3.2.3. Relational Capital

Relational capital, another element of intellectual capital, generally covers the relationships of an organization with its external environment. The brand, customers, customer loyalty, distribution channel, business name of an organization, and the alliances or collaborations of the organization can be considered as sub-elements in relational capital (Dzinkowski, 2000).

Relational capital refers to all networks and relationships of an organization with all its stakeholders. These include the relationships with the organization's suppliers, shareholders, customers, community, and the investors (Sveiby, 2019).

Through these networks, valuable resources and knowledge are attained which helps organization to improve and innovate. Therefore, knowledge is exchanged through relational capital and organizations reach a collective knowledge in this way (Collins & Hitt, 2006; Kong & Farrell, 2010). According to research, investing in building good relationships with stakeholders enables organizations to succeed better performance results (Bharadwaj et al., 2021).

When viewed as a whole, intellectual capital is an intangible asset that supports organizations good performance results and competitive advantage in today's changing and rapidly evolving economy. Organizations can improve their ability to innovate and improve by investing in their people, structural and relational capital.

3. RESEARCH DESIGN

The conceptual basis of the research is explained in this part, the purpose of the research, and the hypotheses of the research model are discussed.

3.1. The Purpose and the Importance of the Research

Globalization and internationalization of business activities in today's business world may expose organizations to unexpected events such as crises, uncertainties, external shocks, economic turmoil, natural disasters, and epidemics. In these challenging situations, organizations face difficulties in surviving and continuing their activities without interruption. This situation causes organizations to face difficult conditions that are unpredictable and beyond their control and become a significant threat to their activities and sustainability. Therefore, it has become increasingly important for decision makers that organizations can manage this risk by reacting resiliently and flexibly. This situation draws attention to the importance of the capability of the organizations to overcome difficulties in uncertain, unexpected, and adverse situations. The concept of organizational resilience and how it can be developed has become increasingly important both for decision makers in the business environment and for researchers.

Digital transformation has been considered as a critical way for organizations to develop organizational resilience (Velu et al., 2019). Therefore, it has increasingly attracted the interest of both researchers and practitioners in organizations. Especially in recent years, with the breakout of the COVID-19 pandemic, it has been seen that digitalization has a significant role in ensuring continuity in the activities of organizations and protection from possible damages. The existing literature related to digital transformation mostly focuses on its conceptual framework, antecedents, and consequences, but lacks investigation of the impact mechanism of digital transformation of organizations on organizational resilience.

The fact that the service sector, and especially the healthcare industry, has a service-intensive structure and a high level of personal interaction is, therefore quite sensitive to crises and shocks such as regulatory changes, natural disasters, and pandemics. The dependence of healthcare services on technology and the increasing e-health applications and benefits reveal the importance of digitalization for the sector. Importance of organizational resilience has taken more attract due to the high probability of crises in the healthcare industry.

In this empirical study, the impacts of digital transformation on the organizational resilience in organizations operating in the healthcare industry in Türkiye were explored. In addition, the role of

intellectual capital in the relationship between digital transformation and organizational resilience was investigated.

Organizational resilience topic is very important in today's increasingly volatile, ambiguous, complex, and changing business environment. Nevertheless, how to achieve and maintain it is still a debated issue for researchers and practitioners. Despite digitalization is considered as an effective tool for resilience of the organizations, existing literature focuses on the concepts, antecedents, and consequences of digital transformation. There is a limited amount of empirical research on digital transformation and organizational resilience in the healthcare industry, as well as on the impact of intellectual capital on organizational resilience. Thus, the research is important since it aims to contribute to the literature by exploring the impacts of both digital transformation and intellectual capital on the organizational resilience of the healthcare industry.

3.2. Hypotheses Development and the Research Model

The view that digital transformation is an important factor in improving organizational resilience stems from the dynamic capabilities view. Dynamic capabilities are the ability of organizations to create, reconfigure, and integrate their external and internal capabilities to adapt to expeditiously changing environmental conditions that are prone to crises and fluctuations (Teece et al., 1997: 516).

Dynamic capabilities aim to explain how organizations can maintain and develop their competitive advantages and strategies in intensely competitive environments and increasingly uncertain environmental conditions. Based on this, organizations use their dynamic capabilities for the purpose of adoption of digital technologies in response to rapidly changing conditions (Matarazzo et al., 2021; Warner & Wager, 2019).

Organizations must reconfigure their corporate capabilities to constantly renew or reconstruct them to compete in dynamic environments. Research emphasizes that digital transformation provides innovative ways to reconfigure resources, processes, and structures, accordingly, facilitates, and triggers dynamic capabilities (Warner & Wager, 2019).

Resilient organizations can manage processes in detecting crises, adapting and responding, and recovering from crises. In these cases, digital transformation improves organizations' perception of crises. Thanks to digital technologies, organizations can adopt changes in their external and environments more quickly and the transformation in the organization can occur more easily (Lenka et al., 2017).

Digital technologies emerge as factors that facilitate the interconnection of internal and external resources, the collection, and scope of information, and the acceleration of decision-making and response times. As an example, automatic algorithmic decisions can be applied by using artificial intelligence programs in organizations and the use of smart devices and services in activities (Vila, 2019). Li et al. (2021) revealed in their study that digital technologies could improve data processing and information gathering capabilities and increase agility of the organizations.

Another effect of digital transformation is that it allows the activities of organizations to be more coordinated and integrated (Williams et al., 2017). When organizations are more integrated and coordinated, they can act and respond more quickly to crises or unexpected negative situations, which can speed up their recovery processes after adverse situations.

Destructive events disrupt the existing situation and functioning of organizations. In this context, its effects on organizations are very important and threaten the continuation of activities. Effectively ensuring organizational resilience requires structuring and reconfiguration of the resources of the organization efficiently. Thanks to digital technologies, both inter-level and inter-departmental interactions in the organization and labor division can positively affect resilience.

According to Velu et al. (2019), it is necessary to maintain interaction, communication, and commitment in case of increased uncertainties and disturbances, and the integration and coordination capabilities of the organization can be improved by using information systems. This can increase organizational resilience.

Leong et al. (2015) investigated the effect of social media technologies, one of the digital transformation tools, in a case study about a natural disaster. According to the research, it was found that social media technologies could be beneficial in the coordination and resource integration of external and internal resources in society.

Digital transformation offers new value propositions by breaking the original business logic that currently exists in organizations. Thus, it allows the establishment of new business models in the organization and encourages the restructuring and transformation of organizations (Li, 2020).

The effects of digital transformation on the development of talents in the organization can be summarized as follows:

- To improve the organization's perception, adaptation and reaction abilities,
- Increasing information collection and processing in case of crisis or disruptive events in the organization,
- To improve the ability of organizations to integrate, coordinate, and rebuild their resources.

In today's changing business conditions, organizations need to realize organizational change through digital transformation. Digital transformation is the reformation of the business processes, structure, culture, vision, strategies, vision, and corporate capabilities of the organizations to align with the digital age. In summary, organizations can achieve digital transformation by utilizing digital technologies in their business processes and activities to remain competitive in changing environmental conditions (Kraus et al., 2022).

Digital transformation in the healthcare industry refers to the usage of the latest digital information and technologies in the healthcare field and the continuing processes that develop accordingly. It includes many applications such as keeping health records electronically, computer-aided decision support systems, imaging, and visualization systems, ensuring digitalization in healthcare services provided to the public, mobile health applications, monitoring patients at home, and making innovations using information and communication technologies (European Commission, 2018).

The increased use of new digital technologies has caused important effects on sectors worldwide. It is expected that the healthcare industry will also be affected by digital transformation as well (Ruiz Morilla et al., 2017). Many studies have been conducted on digitalization in the healthcare industry, but the focus has been on technologies used in the field of healthcare, not on the strategic issues.

Digital transformation in the healthcare industry affects many aspects of health systems, such as processes, structures, diagnosis, treatment, and follow-up methods. It facilitates and accelerates the flow of information, improves the quality of healthcare services, reduces costs, and increases patient safety as well.

Digital transformation improves the abilities of the organization to perceive, integrate, coordinate, and rebuild itself, thus affecting the resilience of the organization. In a study regarding the relationships between digital transformation and organizational resilience, it was found that digital transformation has a positive impact on the organizational resilience of organizations, and exploitative and exploratory innovation mediates the relationship between the constructs (Zhang et al., 2021). Based on these, the following was hypothesized:

H1. Digital transformation has a positive influence on the organizational resilience.

In the existing literature, the research related to the intellectual capital impacts on the organizational resilience is quite limited. Together with that, the empirical studies on the subject are very recent, and there are studies examining the impacts of the elements of intellectual capital on organizational resilience.

Human capital, as one of the main components of intellectual capital, refers to the resources of the organization related to the individuals in the organization, which consists of skills, knowledge, experience, training, abilities, expertise, and innovativeness (Inkinen, 2015; Sveiby, 2019). According to Liu et al. (2021), human capital is particularly critical for digital transformation and innovation because organizations need employees with digital skills, competencies, and expertise to adapt to the digital age. Structural capital consists of the organization's infrastructure that supports its human capital and includes processes, structural systems, technology, practices, information systems, and intellectual property (Bontis & Chua, 2019). Relational capital is the external and internal relationships and networks of the organization with all its stakeholders (Jiang et al., 2021).

In this study investigating the relationship between human capital and organizational resilience, it was found that training and performance management activities that improve human capital positively affect organizational resilience (Okuwa et al., 2016).

In a study by Wilson (2016), it was stated that the necessary adjustments should be made in human resources strategies to improve the organizational resilience of the business.

According to Douglas (2021), by improving human capital through training, rewards, and performance management systems, the resilience of organization becomes higher.

Relational capital is suggested to have a positive effect on maintaining organizational resilience because it provides social networks. Social networks are among the main resources to overcome unexpected incidents (Morsut et al., 2022). Consequently, the following hypothesis was established:

H2. Intellectual capital has a positive influence on the organizational resilience.

Considering its relationship with dynamic capabilities and digital transformation in organizations, it is accepted that intellectual capital is effective in making innovations and contributing to the quality of activities and processes. In particular, the importance of human capital, an element of intellectual capital, is critical in ensuring digital transformation and adapting to the digital age. This is because innovation and digital transformation activities are carried out by employees with digital skills, know-how and expertise. Relational capital, another element of intellectual capital, is necessary for the realization of digital transformation as it refers to the relationships of an organization with its environment such as investors, customers, shareholders, and suppliers. The reason here is that the organization must establish strong relationships with its stakeholders to access new technologies (Liu et al., 2021).

There is a view that digitalization affects intellectual capital. Because the trend of digitalization in organizations increases the demand for highly skilled and highly educated employees, and this produces new information flows that increase the human capital of organizations (Innocenti & Golin, 2022).

Baral and Stern (2011) emphasized that capital stock is very important to ensure the resilience of systems. The authors divided the capital stock into three as social, human, and natural capital. In the study, it was determined that human capital and social capital were positively and linearly related to the resilience of organizations, while the relationship between natural capital and organizational resilience was found to be parabolic.

It is necessary for organizations to develop new abilities to anticipate impending crises and then overcome them by responding appropriately and resiliently. It is emphasized by many authors that social and relational resources are very important in this situation and contribute to organizational resilience in this context (Powley, 2009; Sutcliffe & Vogus, 2003). Organizations can increase their resilience through social networks, information sharing, and resource exchanges (Lengnick-Hall & Beck, 2009). These resources and activities, which are elements of intellectual capital, help organizations move forward successfully in a coordinated manner in crisis and similar challenging conditions (McGuinness & Johnson, 2014). Shared goals, knowledge, and vision within an organization can be useful in finding and successfully implementing solutions, particularly when faced with unexpected disruptive events (Weick et al., 1999). Empirical studies are available regarding relational resources and the ability to recover in the organization (Gittell, 2008), social capital resources of the organization, and resilience capability (Brewton et al., 2010).

Organizations that support the improvement of human capital for digital transformation can achieve better innovation performance and financial results (Qazi et al., 2021). In another study, it was found that digital transformation has a positive impact on the increase in human capital (Song et al., 2022).

Organizational practices related to digital technologies rely on knowledge, experience and skills of individuals, which are vital components of digital dynamic capabilities (Kindermann et al., 2021).

Liu et al. (2023) studied the concepts of organizational resilience and digital orientation for manufacturing companies and according to the findings of the research, they revealed that digital orientation increases resilience in organizations and that human resources have a moderating impact on the relationship between digital orientation and organizational resilience.

Research has emphasized that human resources have a significant role in the resilience of organizations to difficulties and sudden changes and shocks, and that having enough human resources and the necessary skills makes a critical contribution to resilience. However, beyond these, it was emphasized that it is more important to ensure that the staff is sufficiently motivated and fully committed to corporate goals. In terms of relational capital, how well organizations establish and use their networks determines how resilient they are to challenges. Consequently, the following was hypothesized:

H3. Intellectual capital has a mediating impact on the relationship between digital transformation and organizational resilience.

The conceptual framework of the research model in this study is based on the dynamic capability view. According to the dynamic capability view, organizations adapt their competencies and capabilities to keep up with changing dynamic environmental conditions. Technological developments in today's organizational environment have rapidly increased. In the changing, volatile and uncertain business environment, maintaining and increasing the organizational resilience can be possible through implementation of digital transformation in the organizational structures, systems, and processes, and as well as improving intellectual capital. The dimensions of organizational resilience are robustness, redundancy, resourcefulness, and rapidity. Intellectual capital dimensions are human capital, structural capital, and relational capital (See Figure 3.1).

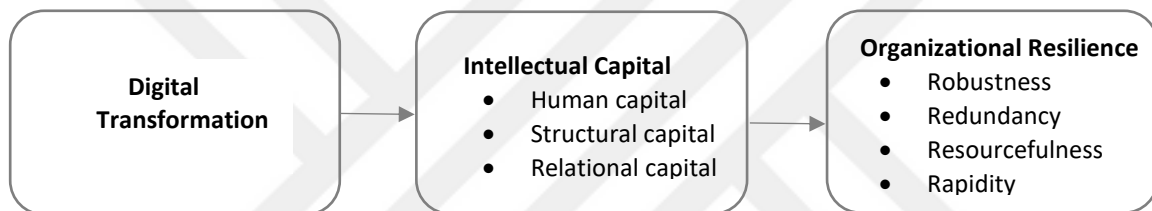


Figure 3.1. The Research Model

The dependent variable is organizational resilience, the independent variable is digital transformation in the research model, and intellectual capital is hypothesized as mediating variable.

Moreover, the impacts of digital transformation on each of the organizational resilience factors were also explored. In these relationships, the mediating effects of intellectual capital factors were investigated. In the main research model, the hypothesis regarding the mediating impact of intellectual capital was denoted as H3. Based on this, these further three hypotheses related to the mediating impact of intellectual capital elements were denoted as H3a, H3b, and H3c.

H3a. Intellectual capital components have a mediating impact on the relationship between digital transformation and robustness.

H3b. Intellectual capital components have a mediating impact on the relationship between digital transformation and rapidity.

H3c. Intellectual capital components have a mediating impact on the relationship between digital transformation and resourcefulness.

In these three research models, the dependent variables are robustness, redundancy, resourcefulness, and rapidity respectively. The independent variable is digital transformation, and the mediator variables are human capital, structural capital, and relational (See Figure 3.2 a-d).

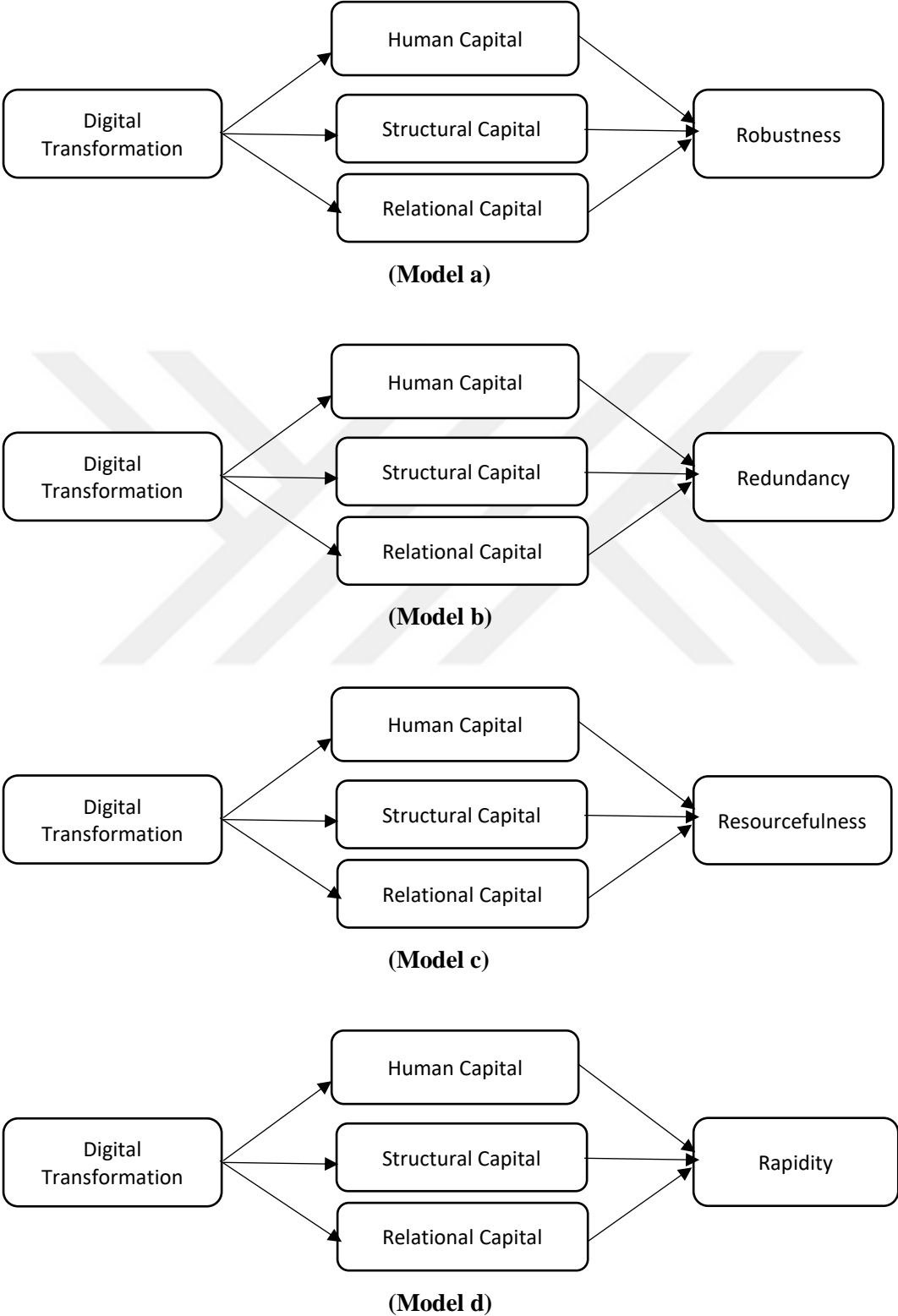


Figure 3.2. The Research Models on Sub-dimensional Basis

4. METHODOLOGY

In this part, the variables in the research model, the scales used for the measurement, and information about the data and the sample are presented.

4.1. The Variables and the Measurement

In this study, a quantitative research method was adopted by using a structured, multi-item questionnaire. The questionnaire consisted of 58 items of which the eight questions were about the demographic characteristics of the respondents and their organizations. These questions included the number of personnel working in the organization, the number of years the organization has been in business, the age, gender, education level of the respondent, and the experience of the respondent in the organization.

For the measurement of the constructs, scales were taken from the existing literature related to organizational resilience, digital transformation, and intellectual capital (See Appendix 1-3). The details of the scales are explained below.

4.1.1. Organizational Resilience

Organizational resilience was measured using the scale taken from Wicker et al. (2013) which, consists of total 21 items, and four dimensions as robustness (5 items), redundancy (5 items), resourcefulness (6 items), and rapidity (5 items) (See Table 4.1).

Table 4.1. The Measurement of Organizational Resilience

Organizational Resilience Scale		
Number of items	21	
Number of dimensions	4	
Dimension and number of items	Robustness	5
	Redundancy	5
	Resourcefulness	6
	Rapidity	5
Origin of the scale	Wicker et al. (2013)	

The robustness refers to the extent of the functions of the organizations that are maintained in crisis or unexpected situations, accordingly, the robustness dimension includes items related to coping

capabilities of the organization with unexpected incidents, external pressures, stress, and challenges. The redundancy dimension investigates the reallocation and reconfiguration capabilities of the resources of the organizations. Resourcefulness dimension on the other hand is related with the prioritizing tasks, mobilizing resources and such capabilities of the organizations during unexpected events. Lastly, the fourth dimension of organizational resilience, called rapidity, is related with the time required for the organizations to return to their activities and operations, it includes items taking necessary responses and achieving goals within the organization in a timely manner.

4.1.2. Digital Transformation

Digital transformation was measured using the scale developed by Nadeem et al. (2018) (See Table 4.2). The scale includes 12 items, which explores such capabilities of organizations like the ability of the organization ability to implement digital technologies in its structures and activities, its capability to carry out strategic initiatives to realize digital transformation and forming a flexible work environment for digital transformation activities.

Table 4.2. The Measurement of Digital Transformation

Digital Transformation Scale	
Number of items	12
Number of dimensions	1
Origin of the scale	Nadeem et al. (2018)

4.1.3. Intellectual Capital

The scale to measure intellectual capital was taken from Wang et al. (2014) which has total 17 items and three dimensions, namely human capital (5 items), structural capital (7 items), and relational capital (5 items) (See Table 4.3).

Table 4.3. The Measurement of Intellectual Capital

Intellectual Capital Scale		
Number of items	17	
Number of dimensions	3	
Dimension and number of items	Human capital	5
	Structural capital	7
	Relational capital	5
Origin of the scale	Wang et al. (2014)	

Human capital dimension is related with the skills, experience, knowledge, abilities, and innovativeness of the personnel in the organization, and the training programs applied within the organization as well. Structural capital dimension consists of items exploring operation procedures, systems, information systems, and the culture and atmosphere in the organization. Lastly, the relational capital dimension includes items that investigate communication, collaboration, relationships, and interactions of the organization with its strategic partners, and stakeholders.

All the scales were measured on a five-point interval scale ranging from 1 to 5. The intervals are as follows, (1) indicates strongly disagree, (2) indicates agree, (3) indicates neither agree nor disagree, (4) indicates agree, and (5) is strongly agree.

4.2. Data Collection and the Sample

Data was collected from healthcare personnel working at hospitals in Istanbul through anonymous self-report questionnaires. The questionnaires were distributed to full-fledged hospitals. These hospitals have surgical departments and various other departments. In terms of type, these healthcare organizations were training and research, public, university and private hospitals. Doctors, chief physicians, nurses, hospital administrators and technical personnel in the hospital constituted target population of the study. A sample of 204 usable questionnaires was obtained from healthcare personnel working in various departments of these hospitals and volunteering to participate in the questionnaires. The distribution of respondents by hospital types are answered as 108 training and research, 43 state, and 53 private hospitals. The descriptive statistics of the respondents are shown in Table 4.4.

Table 4.4. The Characteristics of the Sample

Characteristics	Distribution	n (%)
Gender	Women	118 (57.8%)
	Men	86 (42.2%)
Age	<25	56 (27.5%)
	25-50	139 (68.1%)
	>50	9 (4.4%)
Education level	Undergraduate	34 (16.6%)
	Graduate	135 (66.2%)
	Postgraduate	35 (17.2%)
Experience in the organization	<1 year	22 (10.8%)
	1-10 years	160 (78.4%)
	>10 years	(10.8%)

5. FINDINGS

First, the validity and reliability of the scales were tested prior to the hypotheses tests with explanatory factor analyses (EFA) and Cronbach's Alpha reliability test due to the fact that these scales were used in Turkish Healthcare Industry context for the first time.

Then, with confirmatory factor analyses (CFA) and composite reliability tests, we tested if the scales' original factors could be confirmed or if the results of the EFA indicated a better fit for our context.

After the validity and reliability, the hypotheses testing was performed through regression analyses. Then the hypotheses regarding mediation were tested through the Sobel test as well. Moreover, the model testing was carried out using Structural Equation Modeling.

5.1. Reliability and Validity of the Scales

After the collection of the data, reliability and validity tests of the scales were carried out. The reliability and validity of the scales are the two important features in the evaluation of the measurement instrument and these features ensure correct estimate of a construct.

The aim of the **factor analysis** is to minimize the data set to specify the observed variables with a small number of factors (Brown, 2009). In the factor analysis, the factor loadings indicate the percentage of each item to be loaded to the factors, and total variance explained refers to the capacity of items to measure the related variable. In the rotated component matrix, the values above .50 are considered as acceptable. The Kaiser-Meyer-Olkin (KMO) value is the measure of sampling adequacy and have value in the range of 0 to 1. When KMO value is greater than .80 the data are well suited for the use in the factor analysis.

Cronbach's Alpha is one of the most used measures for the **reliability test**. It refers the internal consistency, the value is in the range between 0 and 1, and close to 1 indicates high internal consistency. The threshold for the Cronbach's Alpha value to be considered as reliable for a scale is .70 (Hair et al., 2011).

Confirmatory factor analyses using Structural Equation Modelling (SEM) were conducted for each scale used in the research. There are many types and numbers of model fit indices used to evaluate model fit for the model being tested in SEM. Generally used fit indices are chi-square (χ^2/df), the root-mean-square residual (RMR), the comparative-fit-index (CFI), incremental fit index (IFI), and the root-mean-square error of approximation (RMSEA).

The chi-square/df ratio (χ^2/df) which is less than 5 shows that the overall fit of the model is acceptable, even if the χ^2 is significant. The RMR value is the square root of the difference between the residuals of the sample covariance matrix and the covariance model hypothesized in the research. It ranges between 0-1, and 0 indicates the perfect fit. The RMR value less than .08 shows that the model fit is acceptable. RMSEA value is defined as the root mean square error of approximation. The fact that this value is less than 0.08 indicates that it is acceptable. CFI value is defined as the comparative fit index, a CFI value greater than .90 indicates an acceptable value. IFI is incremental fit index, and TLI is Tucker Lewis index, both having value of greater than .90 indicates as acceptable values.

5.1.1. Organizational Resilience Scale

Explanatory factor analysis results for organizational resilience scale are shown in Table 5.1. For the 21-item organizational resilience scale, KMO value was found out as .95, and Barlett's test of sphericity was found significant.

The original organizational resilience scale has four dimensions with the names of robustness, redundancy, resourcefulness, and rapidity, and total 21 items. The factor analysis for organizational resilience scale revealed 21 items and three factors.

When the items were evaluated, it was found that seven items were related to the robustness factor with factor loadings ranging between .60 to .76, seven items were related to the rapidity factor with the factor loadings in the range of .53 to .80, and seven factors were about the resourcefulness factor with factor loadings between .51 to .69. The items in redundancy factor in the original scale were distributed to these three factors. Total variance explained was calculated as 63.62% (See Table 5.1).

Table 5.1. Exploratory Factor Analysis Results of Organizational Resilience Scale

Factor Name	Number of Items	Item Description (Our organization has the capability...)	Factor Loading	VE (%)
Robustness	7	To cope with the impact of unexpected incidents.	.76	23.63
		To withstand external pressures.	.75	
		To cope with challenges.	.74	
		To withstand stress without losing focus.	.72	
		To continue to deliver its services during unexpected events.	.65	
		To employ alternative options to sustain operations during unexpected events.	.63	
		To use other facilities when its own facilities cannot be used.	.60	
Rapidity	7	To achieve goals in a timely manner.	.80	20.66
		To adapt quickly to changing circumstances.	.76	
		To acquire support from other organizations when needed.	.68	
		To meet priorities in a timely manner.	.66	
		To restore services quickly during unexpected events.	.58	
		To identify problems during unexpected events.	.54	
		To respond quickly to disruptive events.	.53	
Resourcefulness	7	To generate revenue from multiple sources.	.69	19.33
		To substitute volunteers across positions.	.69	
		To mobilize resources during unexpected events.	.68	
		To substitute equipment when its own equipment cannot be used.	.59	
		To employ sufficient back up resources to sustain operations during unexpected events.	.59	
		To re-allocate resources within the organization.	.51	
		To prioritize tasks during unexpected events.	.51	
Total	21			63.62

Note. *KMO*=.95; Barlett's test of sphericity $\chi^2(210)=2874.19$ $p=.000$; VE = variance explained

Confirmatory factor analyses results to test the organizational resilience scale are indicated in Figure 5.1 to Figure 5.3. First, we started with testing a unidimensional model, then the original four factor model was tested. The analyses were finalized by testing the 3-factor model developed after the EFA.

According to the results of confirmatory factor analysis, the standardized loadings of the items range between .50 to .78, and all were found to be significant. The scale is measured with 21 items as in the original scale (See Figure 5.1).

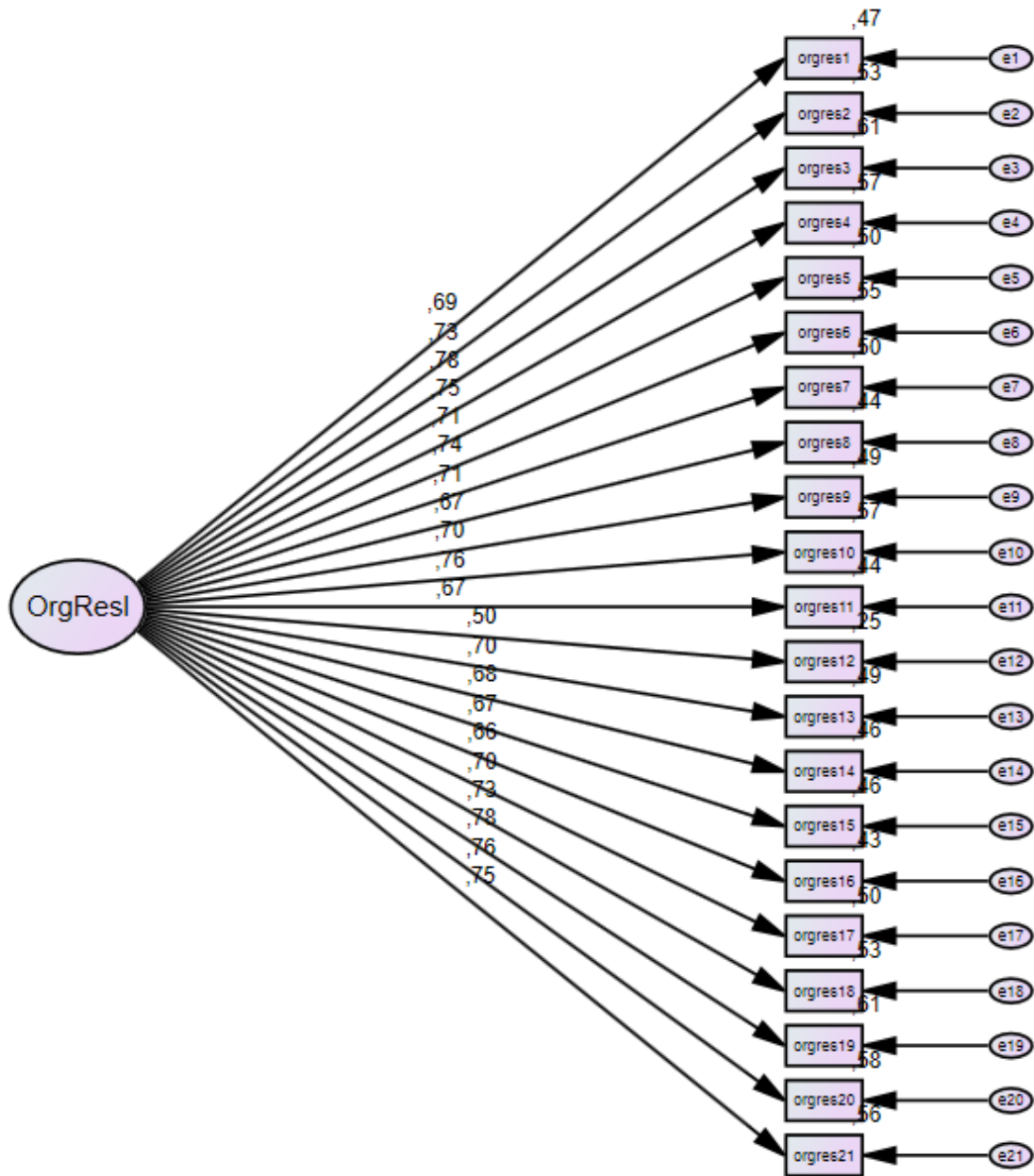


Figure 5.1. Confirmatory Factor Analysis Results of Organizational Resilience Scale

The comparable measured fit indicators for organizational resilience scale and thresholds for each indicator are shown in Table 5.2. As can be seen from the Table unidimensional model could not be accepted.

Table 5.2. Confirmatory Factor Analysis Results for Organizational Resilience Scale

Goodness of Fit Indicators	Acceptance Criteria	Measured Value	Fit Rating
χ^2/df (Chi-square/degrees of freedom)	<5	3.21	Good fit
RMR (Root Mean Residual)	≤ 0.1	.07	Good fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	.10	No fit
CFI (Comparative Fit Index)	≥ 0.90	.85	No fit
IFI (Incremental Fit Index)	≥ 0.90	.85	No fit
TLI (Tucker-Lewis Index)	≥ 0.90	.83	No fit

Confirmatory factor analysis based on the original 4 factors of organizational resilience was carried out. The results of the CFA are shown in Figure 5.2. The factor loadings were found to be in the range of .56 to .86, and all were found significant.

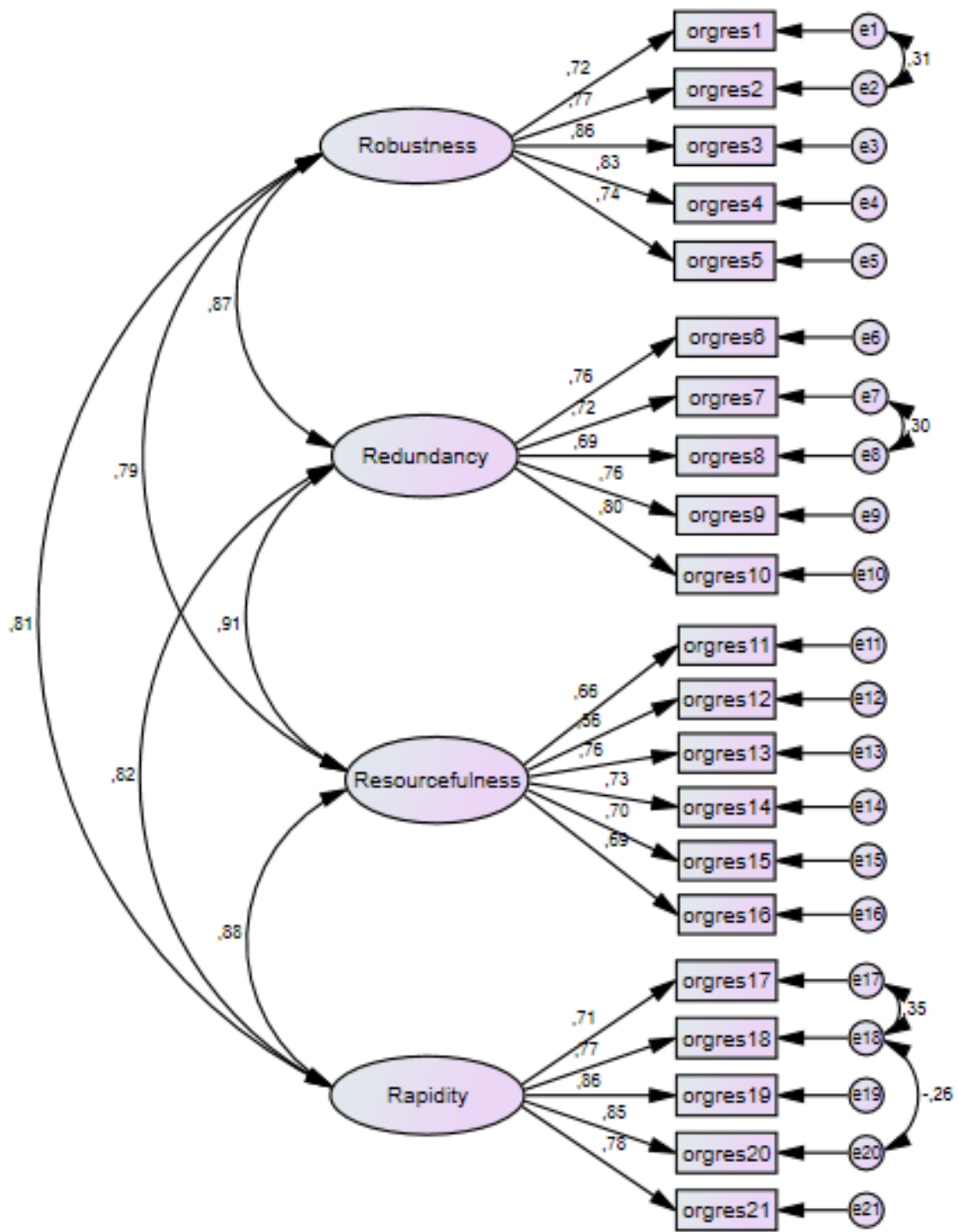


Figure 5.2. CFA Results of Organizational Resilience Scale based on Original Factors

The comparable measured fit indicators for organizational resilience scale and thresholds for each indicator are shown in Table 5.3.

Table 5.3. CFA Results for Organizational Resilience Scale based on Original Factors

Goodness of Fit Indicators	Acceptance Criteria	Measured Value	Fit Rating
χ^2/df (Chi-square/degrees of freedom)	<5	1.87	Perfect fit
RMR (Root Mean Residual)	≤ 0.1	.06	Good fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	.07	Good fit
CFI (Comparative Fit Index)	≥ 0.90	.94	Good fit
IFI (Incremental Fit Index)	≥ 0.90	.95	Good fit
TLI (Tucker-Lewis Index)	≥ 0.90	.93	Good fit

To confirm the new factor structure established through EFA, confirmatory factor analysis test was performed for the organizational resilience scale based on the factors, the 3-factor structure. These factors were robustness, rapidity, and resourcefulness with total 21 items. The results are shown in Figure 5.3. The factor loadings were found to be in the range of .56 to .86, and all were found significant.

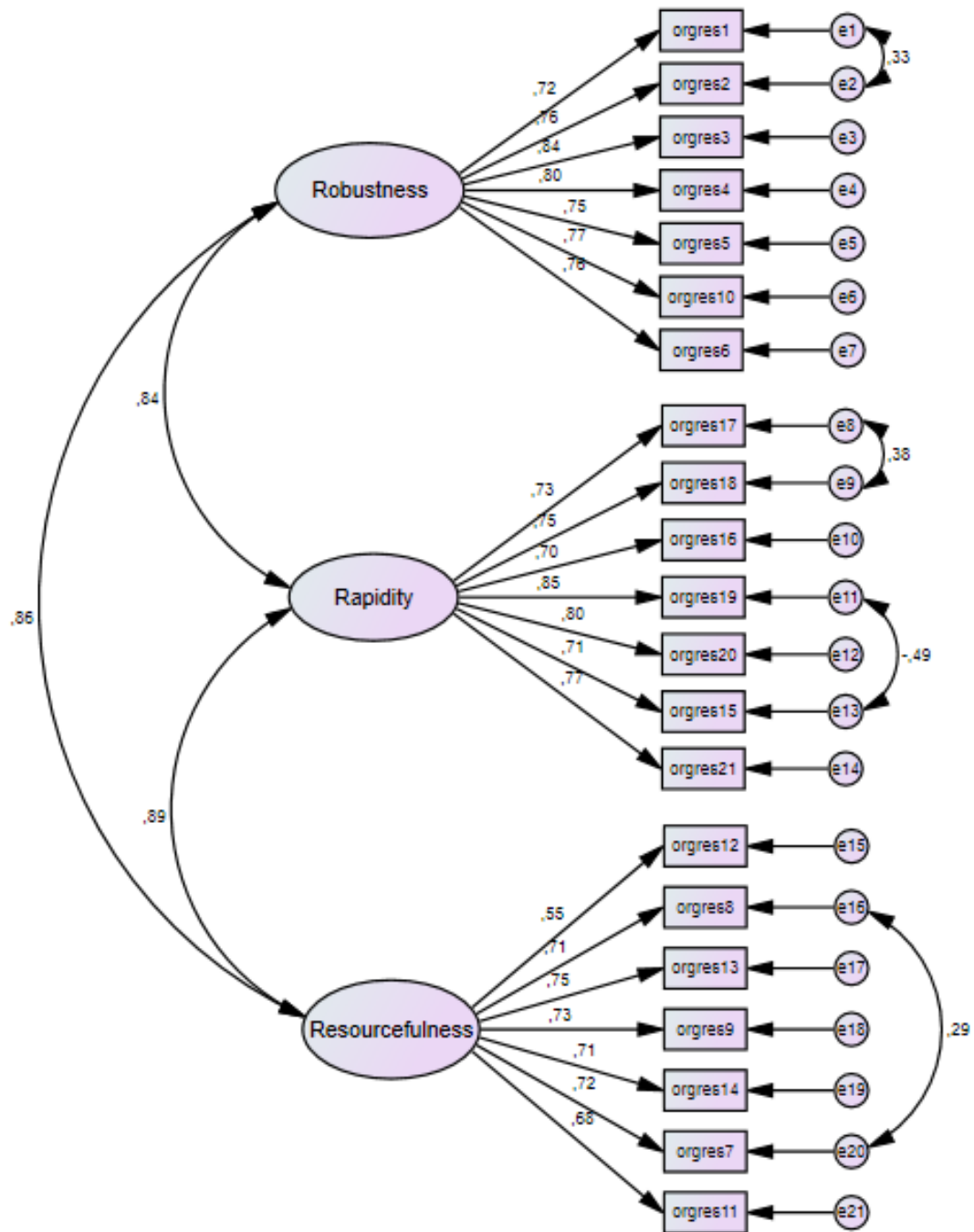


Figure 5.3. CFA Results of Organizational Resilience Scale based on Factors Found

The comparable measured fit indicators for the organizational resilience scale based on the 3-factor structure confirmed good fit (See Table 5.4).

Table 5.4. CFA Results for Organizational Resilience Scale based on Factors Found

Goodness of Fit Indicators	Acceptance Criteria	Measured Value	Fit Rating
χ^2/df (Chi-square/degrees of freedom)	<5	1.92	Good fit
RMR (Root Mean Residual)	≤ 0.1	.05	Good fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	.07	Good fit
CFI (Comparative Fit Index)	≥ 0.90	.94	Good fit
IFI (Incremental Fit Index)	≥ 0.90	.94	Good fit
TLI (Tucker-Lewis Index)	≥ 0.90	.93	Good fit

When all these CFA results for organizational resilience scale are compared in terms of the goodness of fit indicators, it was seen that the factors in the original scale (4 factor) and the factors found through EFA (3-factor) were very close to each other, and both were better compared to the fit indicators in the overall (1-factor) scale which was not acceptable. Moreover, the 3-factor scale (EFA) was found to be slightly better when RMR values are compared (See Table 5.5). Hence we carried out our further analyses with 3 factor model.

Table 5.5. Summary of CFA Results for Organizational Resilience

Goodness of Fit Indicators	Item #	χ^2/df	RMR	RMSEA	CFI	IFI	TLI
1 Factor Scale	21	3.21	.07	.10	.85	.85	.83
4 Factor Scale (Original)	21	1.87	.06	.07	.94	.95	.93
3 Factor Scale (EFA)	21	1.92	.05	.07	.94	.94	.93

The reliability analysis results revealed that Cronbach's Alpha values were found as .91 for robustness factor, .90 for rapidity factor, and .87 for resourcefulness factor of organizational resilience. The Cronbach's Alpha value for the 21-item organizational resilience was calculated as .95. Thus, the reliability of organizational resilience scale and its factors were acceptable. Composite reliability of organizational resilience factors and overall organizational resilience scale were all above the threshold and revealed the reliability of the construct.

Average variance extracted (AVE) reflects the overall amount of variance accounted for by the latent construct. Fornell and Larcker (1981) favor level of .50 or above, but for new scales values more than .45 seems reasonable (Netemeyer, Bearden & Sharma, 2003). As can be seen from Table 5.8, all the AVEs were above .45 threshold (See Table 5.6).

Table 5.6. Reliability Analysis and Explained Variances of Organizational Resilience

Construct	Factor	Item #	α	VE	CR	AVE
Organizational resilience	Robustness	7	.91	23.63	.91	.60
	Rapidity	7	.90	20.66	.90	.58
	Resourcefulness	7	.87	19.33	.87	.49
	Total	21	.95	63.62	.95	.50

Note. α =Cronbach's Alpha, CR= Composite Reliability, AVE= Average Variance Explained

5.1.2. Digital Transformation Scale

For the digital transformation scale used in the research model, the KMO and Barlett's test results revealed that KMO value was calculated as .94, and Barlett's test of sphericity was found significant. Digital transformation scale was found to have 12 items and unidimensional, as in the original scale. Total variance explained was found as 66.04% (See Table 5.7).

Table 5.7. Exploratory Factor Analysis Results of Digital Transformation Scale

Item	Item Description	Factor Loading	VE (%)
1	Our organization has the ability to discover and use new technologies.	.76	66.04
2	Digital transformation activities are included in the organization's value creation.	.84	
3	Improvements are made in the organizational structure, process, and competencies for digital transformation in our organization.	.83	
4	Our organization has taken action in response to digital transformation efforts and has the ability to finance the process.	.83	
5	Our organization's new leadership roles and management approaches facilitate the speed of digital transformation.	.80	
6	Our organization carries out strategic initiatives to create scalable, flexible and value-generating operations to realize digital transformation.	.78	
7	Our organization carries out strategic initiatives to leverage digital transformation to achieve better data optimization.	.78	
8	Our organization constantly carries out strategic initiatives to research and follow digital channels and technologies.	.84	
9	Our organization creates its basic strategies digitally within the framework of corporate competencies.	.84	
10	Our organization leverages the cooperation of partners and stakeholders for complementary competencies that include value preposition and revenue sharing.	.85	
11	Our organization creates intense interactive digital connections with domestic and foreign organizations.	.77	
12	Our organization provides a flexible and attractive working environment for employees who are born into the digital age.	.82	
Total			66.04

Note. KMO=.94; Barlett's test of sphericity $\chi^2(66)=2048.45$ $p=.00$; VE = variance explained

Confirmatory factor analysis was conducted to test the digital transformation scale, which consists of 12 items. The standardized loadings of all items were found to be greater than .50, ranging between .70 to .85, all were found significant (See Figure 5.4).

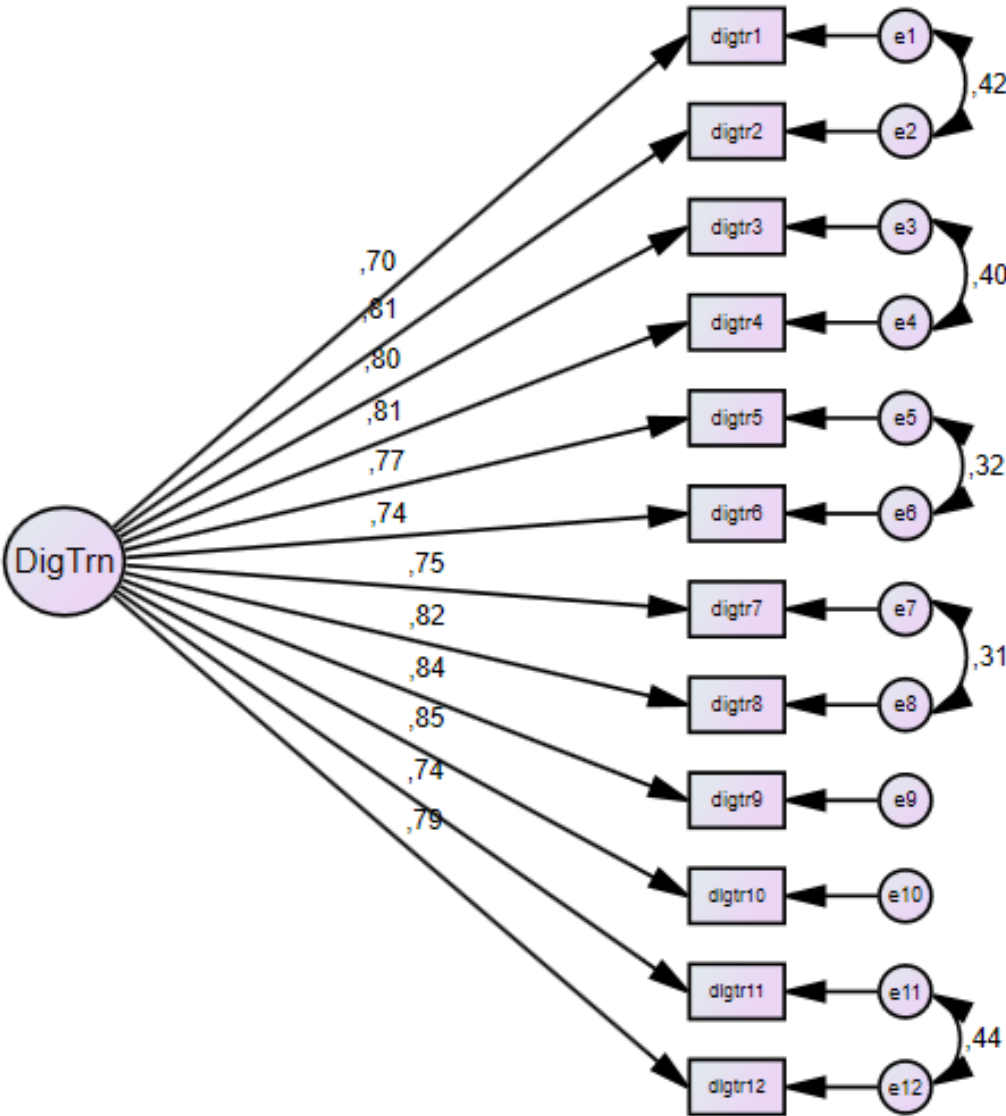


Figure 5.4. Confirmatory Factor Analysis Results for Digital Transformation Scale

The model also demonstrated an acceptable overall model fit with χ^2/df as 2.27, CFI as .96, IFI as .96, RMSEA as .09 and RMR as .05 (See Table 5.8). RMSEA value was slightly above the threshold, but the remaining indicators showed good fit (See Table 5.8).

Table 5.8. Digital Transformation Scale Confirmatory Factor Analysis Results

Goodness of Fit Indicators	Acceptance Criteria	Measured Value	Fit Rating
χ^2/df (Chi-square/degrees of freedom)	<5	2.70	Good fit
RMR (Root Mean Residual)	≤ 0.1	.05	Good fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	.09	No fit
CFI (Comparative Fit Index)	≥ 0.90	.96	Good fit
IFI (Incremental Fit Index)	≥ 0.90	.96	Good fit
TLI (Tucker-Lewis Index)	≥ 0.90	.95	Good fit

Reliability analysis results for digital transformation scale are shown in Table 5.9. The findings revealed that Cronbach's Alpha value came out as .95, and composite reliability exceeding the .70 threshold for acceptance, and AVE was found .62, exceeding the threshold. Therefore, the scale is considered as reliable meaning that these 12 items consistently measure digital transformation.

Table 5.9. Reliability Analysis Results of Digital Transformation Scale

Construct	Factor	Item #	α	VE	CR	AVE
Digital transformation	1	12	.95	66.04	.95	.62

Note. α =Cronbach's Alpha, CR= Composite Reliability, AVE= Average Variance Explained

5.1.3. Intellectual Capital Scale

For the intellectual capital scale, the KMO value was found as .94, and Barlett's test of sphericity was found significant. In the original scale the intellectual capital has, three dimensions with the names of the factors are human capital, structural capital, and relational capital, and total 17 items.

The results of the exploratory factor analysis indicated that the scale consists of 2 factors and 14 items. According to the factor analysis, three items in the human capital dimension in the original scale were removed.

The removed items from the original scale were as follows, "*Employees hold suitable work experience for accomplishing their job successfully in our company.*" "*Employees of our company have excellent professional skills in their particular jobs and functions.*", and "*The company provides well-designed training programs.*"

From the evaluation of the remaining items, it was observed that seven items were related to relational capital, and the factor loadings of these items were found to be between .63 and .83. The other seven

items were related to innovation characteristics regarding to structure and individuals in the organization, and the structural characteristics of the organization.

Therefore, considering that the items contained in the factor also changed, the factor was called innovative structural capital, unlike in the original scale. It was observed that the factor loadings of the items in this factor varied between .59 and .81. Total variance explained was found as 64.8% (See Table 5.10).

Table 5.10. Exploratory Factor Analysis Results for Intellectual Capital

Factor Name	Number of Items	Item Description	Factor loading	VE (%)
Relational capital	7	Our organization maintains long-term relationships with customers.	.83	32.64
		Our organization maintains appropriate interactions with its stakeholders.	.83	
		Our organization has many excellent suppliers.	.77	
		Our organization has stable and good relationships with the strategic partners.	.70	
		Our organization discovers and solves problems through intimate communication and effective collaboration.	.70	
		Our organization emphasizes new market development investment.	.65	
		There is supportive among different departments in our organization.	.63	
Innovator structural capital	7	Our organization responds to changes very quickly.	.81	32.16
		Systems and procedures of our organization support innovation.	.76	
		Our organization has an easily accessible information system.	.74	
		The overall operations procedure of our organization is very efficient.	.71	
		Employees are creative in our organization.	.69	
		Our organization's culture and atmosphere are flexible and comfortable.	.61	
		The employees of our organization often develop new ideas and knowledge.	.59	
Total	14			64.80

Note. KMO=.94; Barlett's test of sphericity $\chi^2(210) = 1911.43$ $p=.000$; VE = variance explained

The confirmatory factor analysis results of the 17-item intellectual capital scale revealed that the factor loading for one item was low (.18), therefore removed from the scale. Thus, CFA revealed that the scale has 16 items. The removed item from the original scale was as follows, "Employees of our company have excellent professional skills in their particular jobs and functions". Confirmatory factor analysis

results for intellectual capital scale are indicated in Figure 5.5. The standardized loadings of the items were in the range of .64 to .78, and all were found significant.

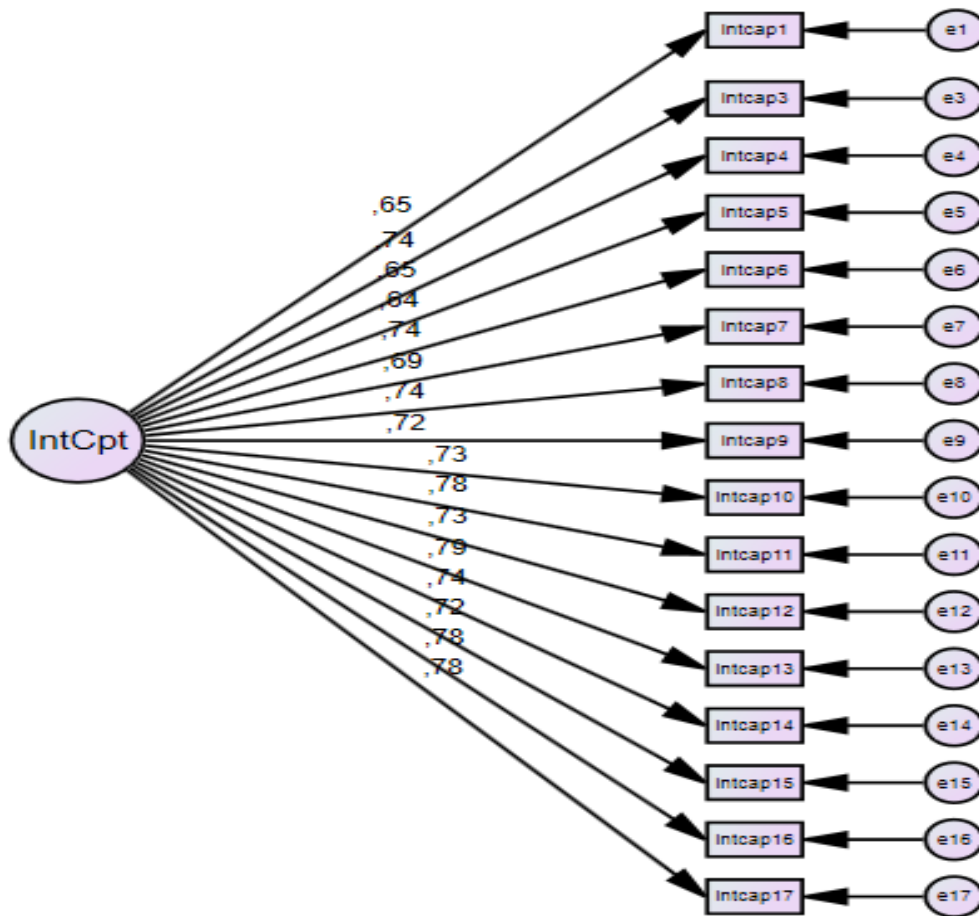


Figure 5.5. Confirmatory Factor Analysis Results for Intellectual Capital Scale

The comparable measured fit indicators for intellectual capital scale and thresholds for each indicator are shown in Table 5.11. The results revealed that the intellectual capital unidimensional fit indicators are not acceptable.

Table 5.11. Confirmatory Factor Analysis Results for Intellectual Capital Scale

Goodness of Fit Indicators	Acceptance Criteria	Measured Value	Fit Rating
χ^2/df (Chi-square/degrees of freedom)	<5	3.80	Good fit
RMR (Root Mean Residual)	≤ 0.1	.08	No fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	.12	No fit
CFI (Comparative Fit Index)	≥ 0.90	.87	No fit
IFI (Incremental Fit Index)	≥ 0.90	.87	No fit
TLI (Tucker-Lewis Index)	≥ 0.90	.84	No fit

Secondly, for intellectual capital scale, the confirmatory factor analysis based on the original factors of intellectual capital (3 factors) was performed. The results are shown in Figure 5.6. The standardized factor loadings were found to be in the range of .56 to .86, and all were found significant.

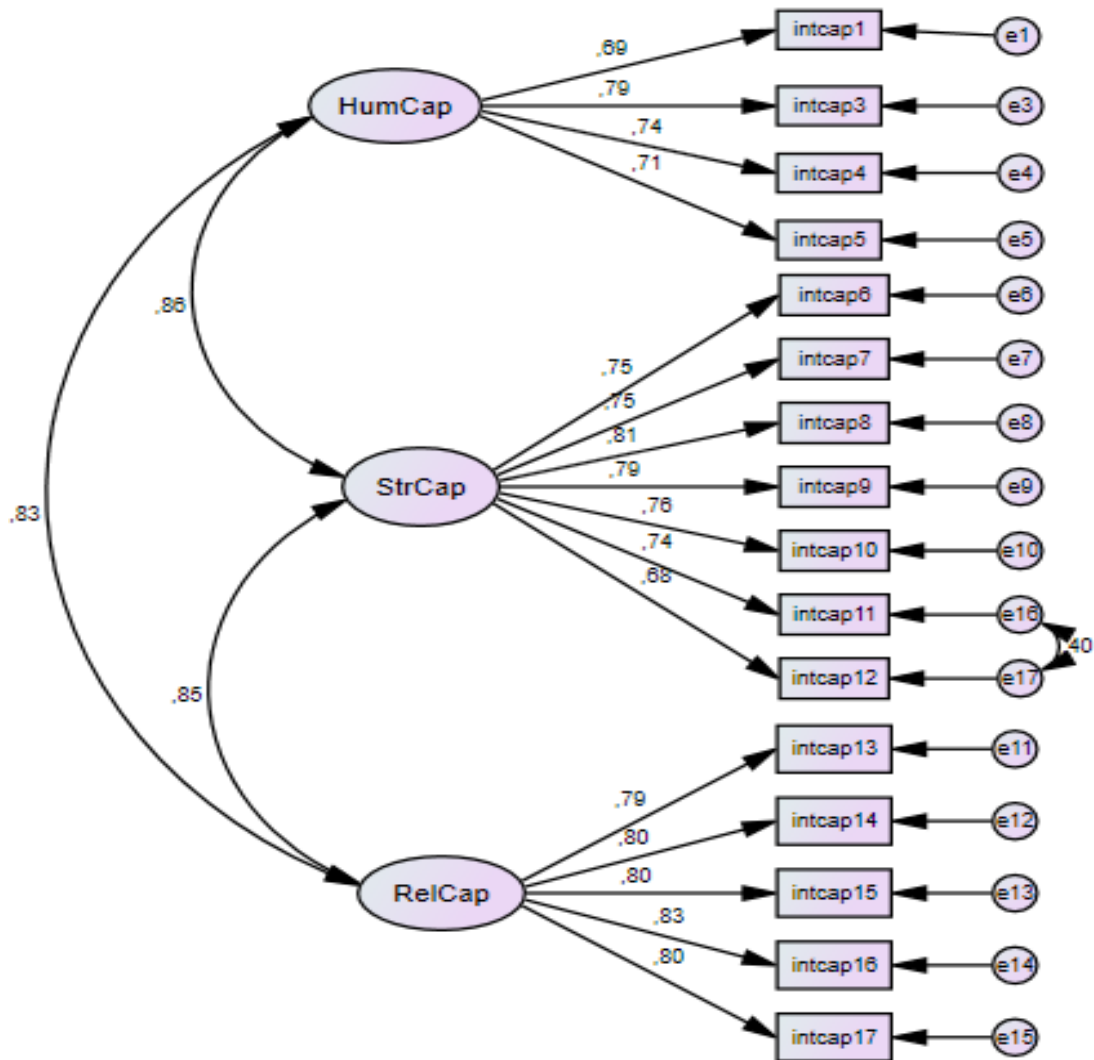


Figure 5.6. CFA Results of Intellectual Capital Scale based on Original Factors

The comparable measured fit indicators for organizational resilience scale based on the original 3-factor structure, and the thresholds for each indicator are shown in Table 5.12. All the indicators except RMSEA were found to be within the accepted thresholds, consequently the scale validity was found good.

Table 5.12. CFA Results for Intellectual Capital Scale based on Original Factors

Goodness of Fit Indicators	Acceptance Criteria	Measured Value	Fit Rating
χ^2/df (Chi-square/degrees of freedom)	<5	2.63	Good fit
RMR (Root Mean Residual)	≤ 0.1	.07	Good fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	.09	No fit
CFI (Comparative Fit Index)	≥ 0.90	.92	Good fit
IFI (Incremental Fit Index)	≥ 0.90	.93	Good fit
TLI (Tucker-Lewis Index)	≥ 0.90	.91	Good fit

Confirmatory factor analysis was performed for the organizational resilience scale based on the factors of organizational resilience that were found through EFA. The results are shown in Figure 5.7.

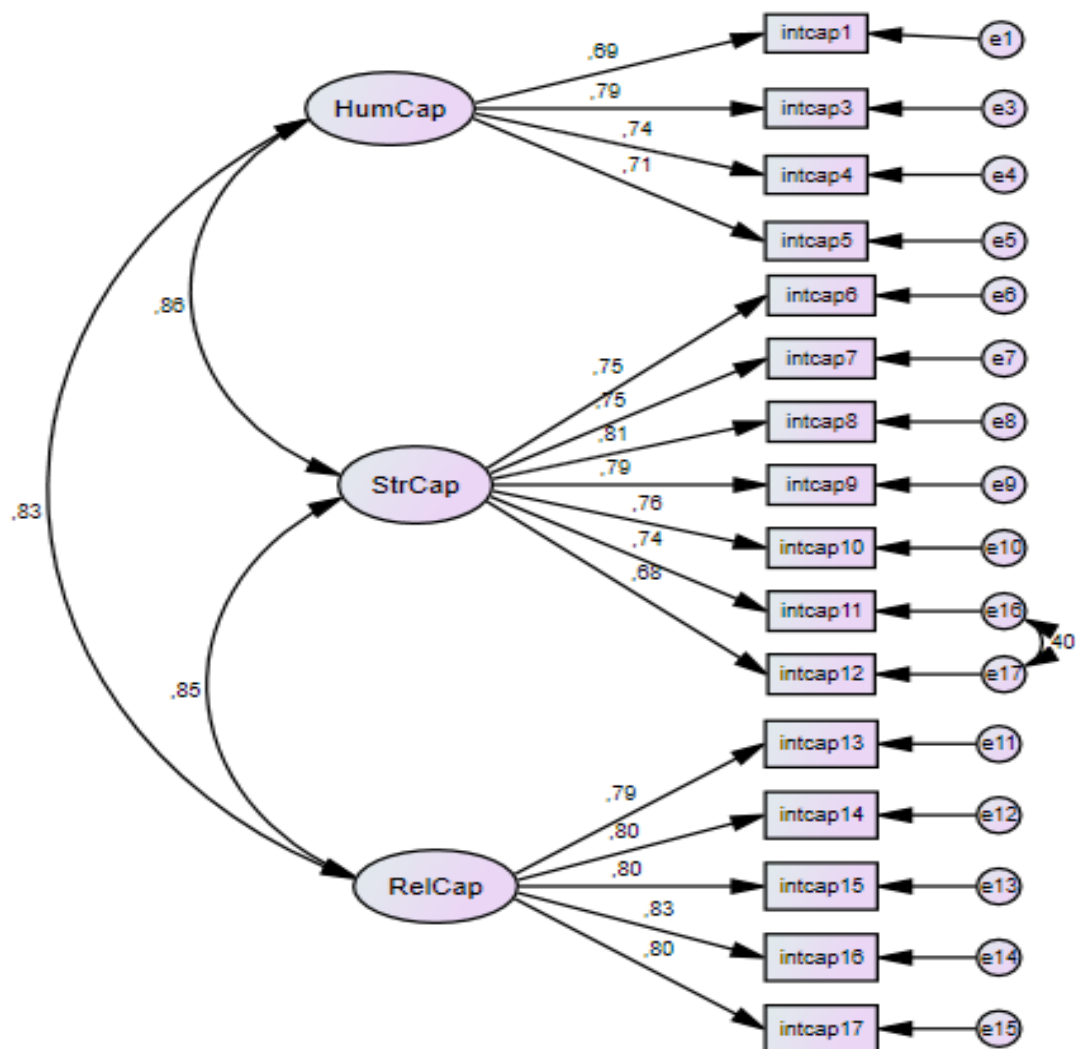


Figure 5.7. CFA Results of Intellectual Capital Scale based on Factors Found

For the 2-factor intellectual capital scale, the factor loadings were found to be in the range of .56 to .86, and all were found significant. The two-factor intellectual capital scale confirmed good fit with all fit indicators within the accepted thresholds (See Table 5.13).

Table 5.13. CFA Results for Intellectual Capital Scale based on Factors Found

Goodness of Fit Indicators	Acceptance Criteria	Measured Value	Fit Rating
χ^2/df (Chi-square/degrees of freedom)	<5	2.17	Good fit
RMR (Root Mean Residual)	≤ 0.1	.06	Good fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	.08	Good fit
CFI (Comparative Fit Index)	≥ 0.90	.95	Good fit
IFI (Incremental Fit Index)	≥ 0.90	.95	Good fit
TLI (Tucker-Lewis Index)	≥ 0.90	.94	Good fit

When all these CFA results for intellectual capital scale are compared in terms of the goodness of fit indicators, it was seen that the factors in the original scale and the factors found through EFA were very close to each other, and better compared to the fit indicators in the overall 1-factor scale, which was not accepted. Fit indicators in 2-factor intellectual capital scale was found to be better than 3-factor intellectual capital scale (See Table 5.14).

Table 5.14. Summary of CFA Results for Intellectual Capital Scale

Goodness of Fit Indicators	Item #	χ^2/df	RMR	RMSEA	CFI	IFI	TLI
1 Factor Overall Scale	16	3.80	.08	.12	.87	.87	.84
3 Factor Original Scale	16	2.63	.07	.09	.92	.93	.91
2 Factor Scale (EFA)	14	2.17	.06	.08	.95	.95	.94

Consequently, for further analyses, the 2-factor intellectual capital scale was used. After CFA, reliability tests were performed for the construct. The results of reliability analysis results are shown in Table 5.15.

Table 5.15. Reliability Analysis Results of Intellectual Capital Scale

Construct	Factor	Item #	α	VE	CR	AVE
Intellectual capital	Relational capital	7	.92	32.64	.91	.60
	Innovator structural capital	7	.89	32.16	.90	.58
Total		14	.94	64.80	.95	.50

Note. α =Cronbach's Alpha, CR= Composite Reliability, AVE= Average Variance Explained

The reliability test results for intellectual capital scale revealed that the Cronbach's alpha value was calculated as .92 for relational capital factor, and .89 for the innovator structural capital, and for the

overall 14-item intellectual capital scale, the Cronbach's alpha reliability was found as .94. Composite reliability values for the factors and for the overall scale were all above the .70 threshold. AVE values were .60 for relational capital, and .58 for innovator structural capital, and .50 for the intellectual capital scale which are above the threshold. The findings indicated that the construct is reliable.

Consequently, for organizational resilience, digital transformation, and intellectual capital, reliability test results showed that the Cronbach's Alpha values of the scales used in the research are above .70 threshold; therefore, all scales were accepted as reliable.

5.2. The Results of the Model Testing

In this part, the regression analysis results of the research model are presented.

5.2.1. The Results of the Regression Analyses

After finding that the scales used in the analyses are reliable for the measurement, a series of regression analyses were performed to test the hypotheses and analyze the research model. The research model hypothesized that the dependent variable is organizational resilience, the independent variable is digital transformation, and the mediating variable is intellectual capital.

Since the research model includes a mediator variable, the regression analyses were carried out using the three-step regression procedure, which was developed, by Baron and Kenny (1986). According to the classic mediation test developed by Baron and Kenny (1986), the impact of independent variable on dependent variable is examined, then the effect of independent variable on the mediator is investigated, and lastly both the independent variable and mediating variable regressed on the dependent variable to test impact of the mediating variable. A mediator variable can account either for the whole or for some part of the observed relationship between two variables. If the effect of independent variable becomes not significant when the mediator is added into the model, full mediation impact is considered. While in the partial mediation, the mediating variable accounts for some, not all, of the relationship between the independent variable and the dependent variable.

The regression analyses results related to the research, which explores the mediating effect of intellectual capital on the relationship between digital transformation and organizational resilience model, are shown in Table 5.16.

Table 5.16. Results of the Regression Analyses of the Research Model

Step	Dependent variable	Independent variable/s	B	s.e.	β	t	p	R ²	F	p
1	organizational resilience	digital transformation	.60	.04	.72	14.83	.00	.52	219.83	.00
2	intellectual capital	digital transformation	.70	.04	.79	18.47	.00	.63	341.14	.00
3	organizational resilience	digital transformation	.38	.06	.46	6.04	.00	.56	128.32	.00
		intellectual capital	.31	.07	.33	4.26	.00			

Note. B=unstandardized coefficient, β = standardized coefficient, s.e.= standard error

In the first step of the regression analysis, the direct effect of digital transformation on organizational resilience was examined. It was found positive and significant ($\beta=.72$, $p<0.05$). The second step of the regression analysis, the impact of digital transformation on intellectual capital, was also found positive and significant ($\beta=.79$, $p<0.05$). In the third step of the regression analysis, intellectual capital was introduced to the research model to test the indirect effect of digital transformation on organizational resilience and the mediating effect of intellectual capital. The findings revealed that intellectual capital has a positive effect on organizational resilience ($\beta=.46$, $p<0.05$), its introduction in the research model reduced the effect of digital transformation on organizational resilience ($\beta=.46$, $p<0.05$). The model fit statistics R² was found as .56 indicating that the regression model can explain 56% of variance in organizational resilience, and F statistic was found as 128.32 for the model.

The results of mediation effects results are shown in Figure 5.8. The impact of digital transformation on intellectual capital is indicated as a, the effect of intellectual capital on organizational resilience is shown as b, the impact of digital transformation on organizational resilience is shown as c' and the total effect of digital transformation on organizational resilience is indicated as c. The mentioned coefficients in the mediation analysis are unstandardized coefficients. The finding that $c'<c$ indicates existence of partial mediation effect of intellectual capital in the model.

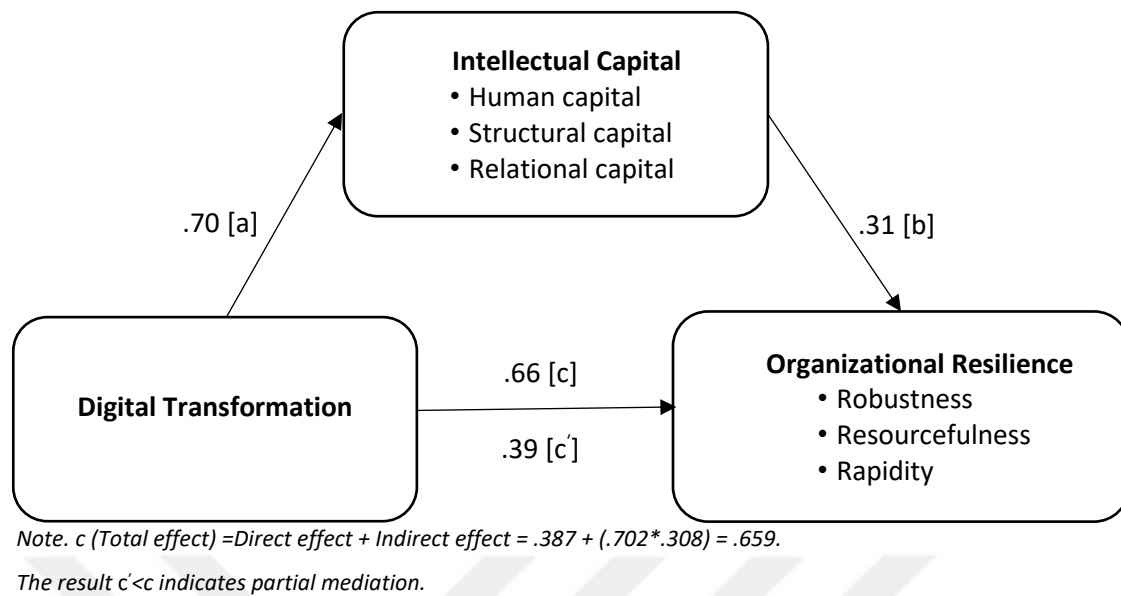


Figure 5.8. Results of Regression Mediation Effects

The mediation analyses revealed that digital transformation has a positive effect on organizational resilience and intellectual capital has a partial mediating effect in the relationship between digital transformation and organizational resilience. Overall, the regression analyses results supported all the hypotheses, H1, H2, H3, in the research model. Together with that, H3 hypothesis is that intellectual capital has a mediating effect in the relationship between digital transformation and organizational resilience, the results of the research showed a partial mediating effect of intellectual capital in that relationship. The results indicated that an increase in digital transformation leads to an increase in resilience of organizations in the healthcare sector, and intellectual capital has a mediating role in this relationship.

As a further analysis, the Sobel test was carried out to check the significance of the mediating effect of intellectual capital in the research model. When a mediator variable is added in a regression model, any reduction in the impact of independent variable on the dependent variable can be tested through the Sobel test (Sobel, 1982).

The findings of the Sobel test revealed that digital transformation affects organizational resilience, mediated by intellectual capital, the mediation effect was found significant ($z=4.17$, $p=.00$). Consequently, it can be concluded that the findings found by using the three-step mediation analyses which supported the hypotheses H1, H2, and H3 in the research model, were confirmed by the results of Sobel test.

5.2.1.1. The Results of the Regression Analyses on Sub-dimensional Basis

After finding the mediating analyses results, further mediation analyses on sub-dimension basis to test H3a, H3b, and H3c. The impacts of digital transformation on organizational resilience dimensions, namely, robustness, rapidity, and resourcefulness were investigated. The mediating effect of intellectual capital elements, namely relational capital and innovator structural capital were also explored.

In this three-step regression analyses, the dependent variables are robustness, rapidity, and resourcefulness. The independent variable is digital transformation, and the mediator variables are relational capital, structural capital, and human capital. Therefore, three separate regression analyses were performed. Among the organizational resilience factors, firstly the regression analysis for robustness factor were performed.

Table 5.17. Results of the Regression Analyses for Robustness Factor of Organizational Resilience

Step	Dependent variable	Independent variable/s	B	s.e.	β	t	p	R ²	F	p
1	robustness	digital transformation	.60	.05	.62	11.30	.00	.39	127.67	.00
2	relational capital	digital transformation	.74	.05	.74	15.55	.00	.55	241.73	.00
	innovator structural capital	digital transformation	.67	.04	.74	15.66	.00	.55	245.27	.00
3	robustness	digital transformation	.49	.09	.51	5.70	.00	.40	43.67	.00
		relational capital	.09	.09	.10	1.01	.31			
		innovator structural capital	.07	.10	.06	.66	.51			

Note. B=unstandardized coefficient, β = standardized coefficient, s.e= standard error

Firstly, for the robustness dimension of organizational resilience, the three-step mediation analyses were carried out. In the first step of the regression, it was found that digital transformation positively affects robustness of organizations ($\beta=.62$, $p=.00$).

In the second step of the analysis, it was found that digital transformation affects relational capital ($\beta=.74$, $p=.00$) and innovator structural capital positively ($\beta=.74$, $p=.00$).

And in the third step of the regression analysis, it was found that none of the intellectual capital factors have a mediating effect in the relationship between digital transformation and robustness of healthcare organizations ($p>0.05$). Thus, the H3a hypothesis was not supported (See Table 5.1).

Table 5.18. Results of the Regression Analyses for Rapidity Factor of Organizational Resilience

Step	Dependent variable	Independent variable/s	B	s.e.	β	t	p	R ²	F	p
1	rapidity	digital transformation	.66	.05	.72	14.69	.00	.52	215.72	.00
2	relational capital	digital transformation	.74	.05	.74	15.55	.00	.55	241.73	.00
	innovator structural capital		.67	.04	.74	15.66	.00	.55	245.27	.00
3	rapidity	digital transformation	.38	.07	.42	5.56	.00	.57	89.87	.00
		relational capital	.16	.07	.17	2.16	.03			
		innovator structural capital	.25	.08	.24	3.05	.00			

Note. B=unstandardized coefficient, β = standardized coefficient, s.e= standard error

The regression analyses results for rapidity factor of organizational resilience are depicted in Table 5.18. The results indicated that in the first step of the analysis, digital transformation has a positive influence on the rapidity of organizations ($\beta=.72$, $p=.00$).

The effect of digital transformation on relational capital and innovator structural capital was found positive, as also shown in the previous regression model for robustness.

And in the third step, the regression analysis results showed that the beta value of digital transformation decreased ($\beta=.42$, $p=.00$), both relational capital and innovator structural capital positively affect rapidity of organizations, the beta coefficients were found $\beta=.17$ ($p=.00$) for relational capital, and $\beta=.24$ ($p=.00$) for innovator structural capital.

These results showed that both relational capital and innovator structural capital have partial mediating impacts on the relationship between digital transformation and rapidity of organizations. When the coefficients were examined, it was concluded that the impact of innovator structural capital is higher than the impact of relational capital. Consequently, our H3b hypothesis was supported.

Table 5.19. Results of the Regression Analyses for Resourcefulness Factor of Organizational Resilience

Step	Dependent variable	Independent variable/s	B	s.e.	β	t	p	R ²	F	p
1	resourcefulness	digital transformation	.55	.05	.65	12.20	.00	.42	148.72	.00
2	relational capital	digital transformation	.74	.05	.74	15.55	.00	.55	241.73	.00
	innovator structural capital		.67	.04	.74	15.66	.00	.55	245.27	.00
3	resourcefulness	digital transformation	.37	.07	.43	5.12	.00	.45	55.35	.00
		relational capital	.12	.08	.14	1.61	.11			
		innovator structural capital	.14	.08	.15	1.70	.09			

Note. B=unstandardized coefficient, β = standardized coefficient, s.e= standard error

For the third factor of organizational resilience, resourcefulness, the three-step regression analysis was performed (See Table 5.19). The results in the first step of the regression showed that digital transformation positively affects resourcefulness of organizations ($\beta=.65$, $p=.00$).

In the second step of the analysis, it was found that digital transformation affects relational capital and innovator structural capital positively, as mentioned in the previous regression analysis.

And in the third step of the regression analysis, none of the intellectual capital factors were found to have a mediating impact between digital transformation and resourcefulness relationship ($p>0.05$). Therefore, the H3c hypothesis was not supported.

Consequently, the regression analyses performed for each of the organizational resilience factor as dependent variable, digital transformation as independent variable, and each of the intellectual capital factor as mediating variable revealed that digital transformation affect rapidity factor of organizational resilience, partially mediated by relational capital and innovator structural capital for the healthcare organizations.

Thus, any increase in digital transformation will lead to an increase in rapidity of organizations in the healthcare organizations, and the intellectual capital elements namely relational capital and innovator structural capital mediate this relationship.

After finding the regression results for the main research model, and for the models based on the factors of organizational resilience and intellectual capital, the overall results of all these regression analyses are shown in Table 5.20.

Table 5.20. Summary of the Regression Results

Hypothesis	Hypothesis Description	Result
1	Digital transformation has a positive influence on organizational resilience.	Supported
2	Intellectual capital has a positive influence on organizational resilience.	Supported
3	Intellectual capital has a mediating impact on the relationship between digital transformation and organizational resilience.	Supported*
3a	Intellectual capital elements have a mediating impact on the relationship between digital transformation and robustness.	Not supported
3b	Intellectual capital elements have a mediating impact on the relationship between digital transformation and rapidity.	Supported**
3c	Intellectual capital elements have a mediating impact on the relationship between digital transformation and resourcefulness.	Not supported

*Note. *Intellectual capital was found to have a partial mediating effect. ** Relational capital and innovator structural capital were found to have partial mediating effects.*

5.2.2. Structural Equation Modeling Analysis

Structural Equation Modeling (SEM) is a method that examines the relationships between latent variables by connecting observable variables to latent variables and takes into account multiple relationships between factor structures (Kline, 1998). The research topics of researchers in social sciences generally include concepts that cannot be directly observed. These abstract facts are called latent variables or factors. Because these variables are not directly observed, they cannot be measured directly, and therefore it is necessary to identify measurable actions and behaviors that are thought to represent the latent variable in question. In this way, the latent variable is measured (Byrne, 2010).

SEM is a multivariate analysis that can test research models simultaneously. In SEM, relationships between endogenous and exogenous latent variables are represented diagrammatically. This schematic representation of the model is called path analysis. Through path analysis, causal relationships between two or more variables are examined. Path analysis has some features that make it superior to multiple regression. The first of these is that while there is only one dependent variable in multiple regression, more than one dependent variable can be defined simultaneously in SEM. Another feature of SEM is that variables can be defined as dependent and independent at the same time. With these features of path analysis, it is a more accurate and easier technique than regression (Schumacker & Lomax, 2004).

In this part, the path analysis results of the research model are presented. First, the path analysis results based on the factors found in EFA analysis and confirmed in CFA analysis.

5.2.2.1. Path Analysis Based on the Main Research Model

Structural Equation Modeling path analysis based on the main research model, on the variables (instead of each of the factors) was conducted first.

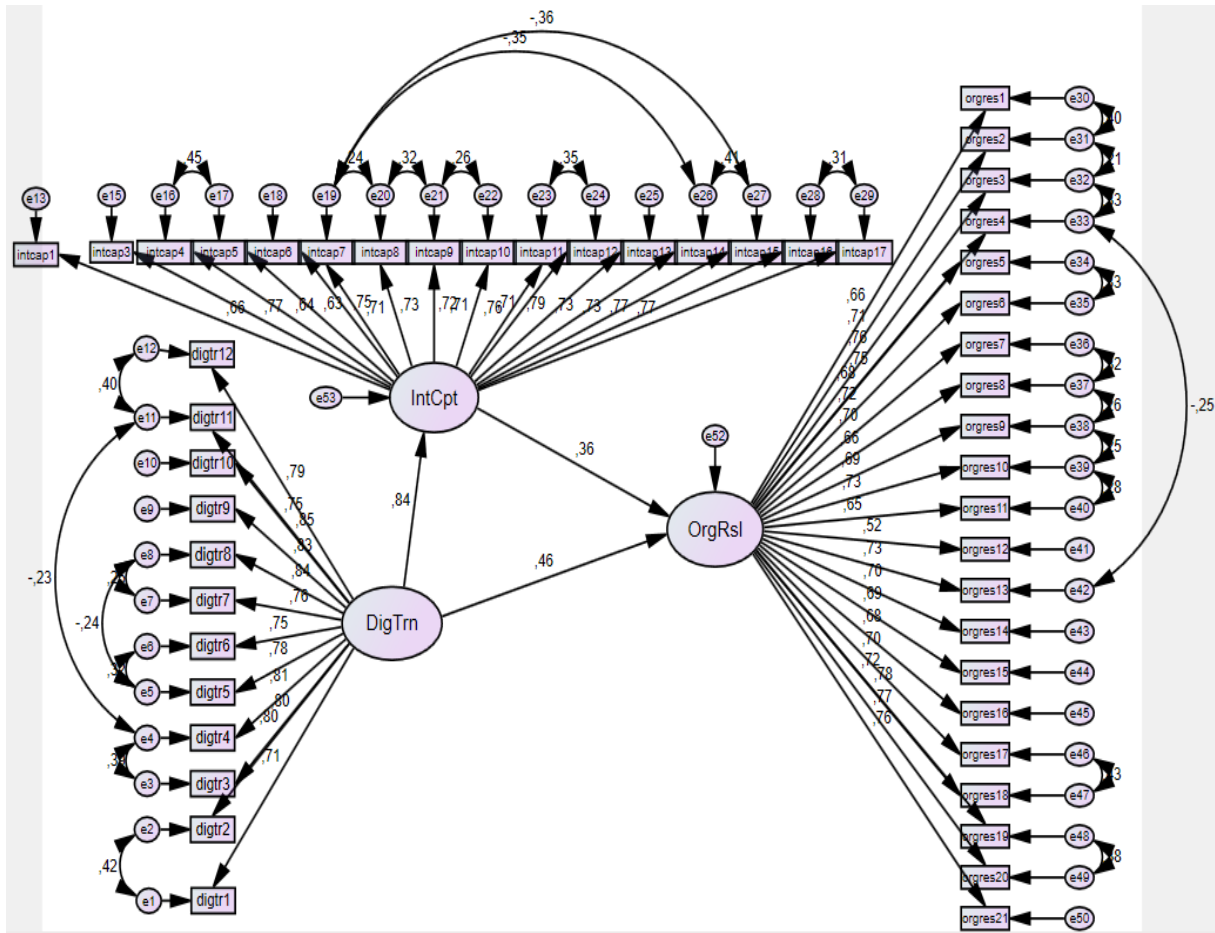


Figure 5.9. SEM Path Analysis Results Based on Main Research Model

The path analysis related to research model is shown in Figure 5.9. The results showed that digital transformation has positive influence on organizational resilience ($\beta=.46$). And the effect of digital transformation on intellectual capital was found as positive ($\beta=.84$), and the impact of intellectual capital on organizational resilience was found positive ($\beta=.36$). All the coefficients were found significant ($p<0.05$). Consequently, all the hypotheses in the research model, H1, H2, and H3, were supported (see Table 5.20).

Table 5.21. Structural Equation Modeling Analysis Results Based on Main Research Model

Paths between variables	B	s.e.	β	C.R.	p
Digital transformation -> Organizational resilience	.47	.12	.46	4.11	***
Digital transformation -> Intellectual capital	.74	.09	.84	8.33	***
Intellectual capital -> Organizational resilience	.42	.13	.36	3.28	.00

Note. B: Unstandardized coefficient, β : Standardized coefficient, s.e.: Standard error

Standardized total, direct, and indirect effects:

Digital transformation -> organizational resilience; total: .76, direct: .46, indirect: .30.

Digital transformation -> intellectual capital: direct: .84.

Intellectual capital -> organizational resilience; direct: .36.

The research model confirmed good fit ($\chi^2/df = 1.69$, RMR=.07, RMSEA=.06, CFI=.90, IFI=.90, and TLI=.90.) (See Table 5.22).

Table 5.22. SEM Results of Model Fit Indicators Based on Main Research Model

Goodness of Fit Indicators	Acceptance criteria	Measured Value	Fit rating
χ^2/df (Chi-square/degrees of freedom)	<5	1.69	Good fit
RMR (Root Mean Residual)	≤ 0.1	0.07	Good fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	0.06	Good fit
CFI (Comparative Fit Index)	≥ 0.90	0.90	Good fit
IFI (Incremental Fit Index)	≥ 0.90	0.90	Good fit
TLI (Tucker-Lewis Index)	≥ 0.90	0.90	Good fit

The results of Structural Equation Modeling revealed that digital transformation has a positive impact on organizational resilience, and intellectual capital has a mediating effect in this relationship.

5.2.2.2. Path Analysis Based on Sub-dimensions with Factors Found

Since the factor analyses revealed that two of the concepts used in our model were not unidimensional, it was necessary to further analyze the model detailed with the underlying factors just as we did with regression analyses. In addition, SEM gave the opportunity to analyze the full model as it was with all three dependent variables (the 3 factors of resilience) in the same model in comparison to separately tested regressions.

Based on this, the Structural Equation Modeling path analysis were performed based on the factors found through factor analysis. The path analysis is shown in Figure 5.10.

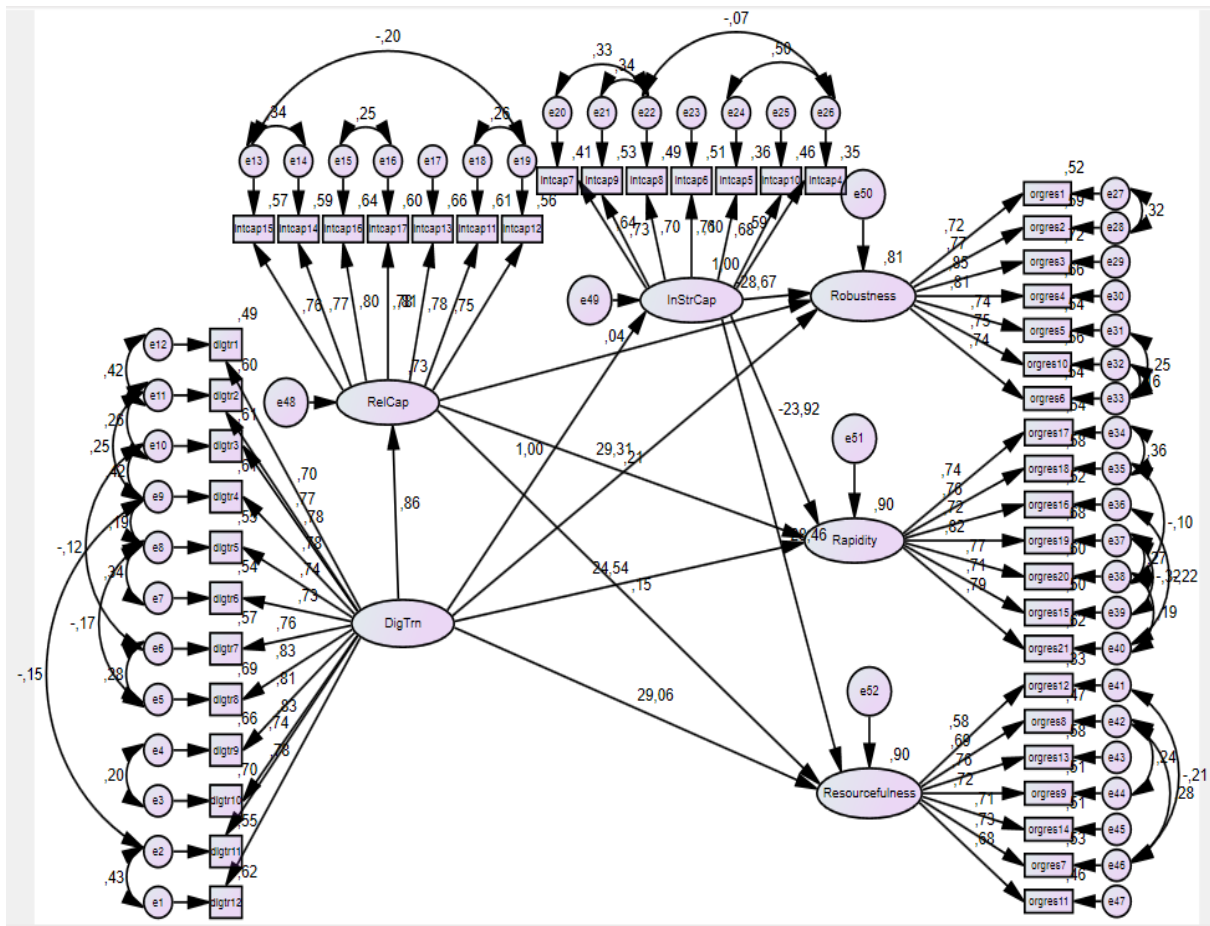


Figure 5.10. SEM Path Analysis Results Based on Sub-dimensions with Factors Found

The findings showed that digital transformation has positive influence on intellectual capital components of relational capital and innovator structural capital ($p < .05$) (See Table 5.23).

Table 5.23. SEM Analysis Results Based on Sub-dimensions with Factors Found

Paths between variables	B	s.e.	β	C.R.	p
Digital transformation -> Robustness	29.97	61.60	29.30	.49	.63
Digital transformation -> Rapidity	20.11	41.23	24.54	.49	.63
Digital transformation -> Resourcefulness	19.91	40.97	29.07	.49	.63
Digital transformation -> Relational capital	.78	.08	.86	10.27	***
Digital transformation -> Innovator structural capital	.79	.08	1.00	9.66	***
Relational capital -> Robustness	.19	.11	.04	1.78	.08
Relational capital -> Rapidity	.19	.11	.21	1.77	.08
Relational capital -> Resourcefulness	.11	.10	.15	1.07	.29
Innovator structural capital -> Robustness	-37.14	78.18	-28.67	-.48	.64
Innovator structural capital -> Rapidity	-24.84	52.33	-23.93	-.48	.64
Innovator structural capital -> Resourcefulness	-24.70	52.00	-28.46	-.48	.64

Note. B: Unstandardized coefficient, β : Standardized coefficient, s.e.: Standard error

The calculated fit indicators of the model which is based on the sub-dimensions are shown in Table 5.24. The indicators showed good model fit ($\chi^2/df=1.71$, RMR= .06, RMSEA= .06, CFI= .91, IFI= .91, and TLI=.90).

Table 5.24. SEM Analysis Model Fit Indicators Based on Sub-dimensions

Goodness of Fit Indicators	Acceptance criteria	Measured Value	Fit rating
χ^2/df (Chi-square/degrees of freedom)	<5	1.71	Good fit
RMR (Root Mean Residual)	≤ 0.1	0.06	Good fit
RMSEA (Root Mean Square Error of Approximation)	≤ 0.08	0.06	Good fit
CFI (Comparative Fit Index)	≥ 0.90	0.91	Good fit
IFI (Incremental Fit Index)	≥ 0.90	0.91	Good fit
TLI (Tucker-Lewis Index)	≥ 0.90	.90	Good fit

Interestingly these findings did not support the mediating effect of intellectual capital on the relationship between digital transformation and organizational resilience. In fact, this full model did not support the relation between digital transformation and organizational resilience. The only significant finding was between digital transformation and intellectual capital. Therefore, we can conclude that even though when tested, the main concepts indicated impact on each other, the detailed model could not identify these relationships.

5.2.3. Model Testing Summary

The hypotheses of the research were that digital transformation affects resilience of the organizations positively, and intellectual capital has a mediating impact in this relationship. Moreover, it was hypothesized that digital transformation has positive impacts on each of the organizational resilience factors, and these relationships are mediated by intellectual capital factors. These hypotheses were tested through regression analysis.

As a result of the exploratory factor analysis organizational resilience scale was found to have three factors namely robustness, rapidity and resourcefulness, while it was measured through four factors in the original scale, namely robustness, redundancy, resourcefulness, and rapidity. Digital transformation is measured with unidimensional scale. Intellectual capital exploratory factor analysis results indicated the scale has two factors, while in the original scale the number of factors was three, namely human capital, structural capital, and relational capital. Exploratory factor analysis revealed that the two factors found were related to relational capital, and human and structural innovation. Thus, one factor name

was kept as in the original scale, relational capital, and the name of the second factor was changed as innovator structural capital.

Then, confirmatory factor analyses and composite reliability tests were applied to test whether the original factors of the scales could be confirmed or if the results of the EFA indicated a better fit for our context.

After finding the scales were valid and reliable, regression analyses were conducted to test the hypotheses. According to the results of classic three-step mediation regression analysis, digital transformation was found to have a positive effect on organizational resilience. When intellectual capital was added into the research model, the effect of digital transformation on organizational resilience decreased which indicated the partial mediating effect of intellectual capital. The hypotheses of the research model were supported. According to this, an increase in digital transformation leads to an increase in resilience of the organizations. These findings are compatible with the existing literature for the relationship between digital transformation and organizational resilience, and intellectual capital and organizational resilience.

After regression analysis, as a further analysis, the Sobel test was performed for the purpose of checking the significance of the mediation impact of intellectual capital. The Sobel test results indicated that the effect of digital transformation on organizational resilience is positive, which is mediated by intellectual capital.

As additional analyses, research was conducted on the sub-dimensions of organizational resilience and the sub-dimensions of intellectual capital. The aim here was to examine the effects in terms of sub-dimensions. In these regressions, the three sub-dimensions of organizational resilience were the dependent variables. Regression analyzes were performed with digital transformation as the independent variable, and relational capital and innovator structural capital, which are the sub-dimensions of intellectual capital, as mediating variables. These three-step mediation regression analyzes first showed that the positive effect of digital transformation on rapidity of organizations in the healthcare industry is mediated by relational capital and innovator structural capital.

Lastly, the research model was explored through using Structural Equation Modeling. First, path analysis was conducted based on the main research model, by considering organizational resilience, digital transformation, and intellectual capital variables in the analysis. Structural Equation Modeling results revealed that digital transformation has a positive effect on organizational resilience and intellectual capital mediates this relationship. According to these results, the research results revealed by the classical methods of Baron and Kenny (1986) three-stage mediation regression model analysis and Sobel test were confirmed using Structural Equation Modeling. However, when the detailed model with all the underlying

factors and the 3 dependent variables (3 factors of resilience) the findings did not support mediation as well as the impact of digital transformation on organizational resilience sub dimensions.



6. CONCLUSION

In today's globalizing and internationalizing business world, organizations may face uncertainties and many challenging situations such as crises, unexpected events, intense competition, economic and political turmoil, natural disasters, and other disruptive situations.

Organizations face difficulties in managing and reacting to these situations on time to maintain their survival and sustainability. In this context, the importance of resilience in organizational context is increasing as a prominent concept in both academic research and business processes.

The answer to questions of Vogus and Sutcliffe (2007) about why some organizations maintain their functionality despite environmental shocks and other major disturbances and some organizations crumble in the face of difficulties is generally explained by resilience.

Resilience represents the ability of a system to regain its original state after a deformation. Resilience in this context refers to abilities of the organizations to return to their previous levels of performance. Organizational resilience is the capacity to be robust under conditions of stress and change. Organizational resilience is seen, on the one hand, as the ability to absorb disruptions and recover from these events through constant restructuring, and on the other hand, as the ability to develop by turning this into an opportunity after recovery.

Resilience concept has been explored in several disciplines and at different levels of analysis (Clement & Rivera, 2017). Organizational resilience refers to capacity of an organization not only to absorb disruptive shocks but also to develop specific responses and take in transformative actions that enable it to improve after such events (Conz & Magnani, 2020).

Organizational resilience is being researched as an attitude and strategic reaction that will enable organizations to adapt to uncertain changes and turn challenging conditions into an opportunity. Resilient organizations possess the characteristics of coping with challenging conditions while maintaining their ability to achieve their goals (Benn Dunphy & Griffiths, 2014), and can continue their activities uninterrupted by reducing their basic vulnerabilities, as well as to show the necessary reactions and behaviors to develop in the face of disruptions.

Lee et al. (2013) asserts that the concept of resilience in organizations is related to many concepts such as adaptation ability, strategic awareness, management of sensitive issues, shared vision, advance warning systems, strategic planning. Ruiz-Martin et al., (2018) also emphasizes issues such as creating situation awareness, managing the weaknesses of the institution, having resources, improvisational capacity, learning capacity, ability to predict the future, flexibility and agility.

Existing studies related to organizational resilience suggest several factors as antecedents of organizational resilience. Flexibility of organizations, organizational awareness, being innovative, networks of organizations are among the factors that are considered as antecedents of organizations.

From the dynamic capabilities perspective, organizations that ensure their flexibility and resilience by increasing their steps towards digitalization in their business practices, designs, business models, processes, and activities; when faced with challenging conditions, can be able to manage the process effectively thanks to their high ability to perceive the situation, collect, process and analyze data, and then take quick actions and show the necessary reactions towards the solutions. In this mechanism, digital transformation is considered to build and maintain organizational resilience. Organizational resilience focuses not only on recovering from challenging events, but also improving adaptive capacity of organizations, and transformative activities (Lengnick-Hall & Beck, 2005). Human capital comes to the fore as the source of this capacity in organizations. Based on this, intellectual capital which include the human capital, has an important role in the resilience of the organizations.

The healthcare industry is prone to risks due to being dependent of service providers and to technology, and its service-intense nature, and having high-level of personal interaction. The healthcare organizations need to improve their resilience to protect themselves from these risks. The organizations that do not adapt to digital technologies, and do not integrate information and communication technologies within their activities and business processes in time, may fail to correctly identify the requirements arising changing environment, will face significant risks in their main activities.

First, in the study, we tested the scales for Turkish healthcare organizations with confirmatory factor analysis. In this sense, the fact that the scales have been used in a different sector and culture contributes to the literature. The dimensions of the scales were different from the original scale dimensions. It was revealed that organizational resilience has three dimensions namely robustness, rapidity and resourcefulness, while intellectual capital has two dimensions with the names of relational capital and innovator structural capital. In this context, the innovator structural capital factor, one of the dimensions of intellectual capital, has been newly named through the analyses.

The empirical findings reached using classic mediation regression analysis and Sobel test found that digital transformation affects organizational resilience positively, and intellectual capital mediates the relationship between them. As further analysis, the hypotheses were testes by using Structural Equation Modeling which supported the regression analyses findings. Increase in digital transformation leads to increase in resilience of organizations, and intellectual capital has a mediating role in this relationship for the healthcare organizations. The results of the research are compatible with the existing literature for digital transformation and organizational resilience, digital transformation and intellectual capital, and intellectual capital and organizational resilience.

The results of this study, in which the impact of digital transformation on organizational resilience and the role of intellectual capital in this relationship were explored, indicated that when organizations in the healthcare industry are faced with crises, unusual and unexpected situations, it is possible to manage this process in the most appropriate and efficient way through digital transformation and by developing their intellectual capital. Intellectual capital can be improved through supporting innovative activities within organizations, by investing human capital such as knowledge, skills and education, and also strengthening social relations of the organizations with their stakeholders.

The studies in the existing literature mostly focus on the concepts, and antecedents of organizational resilience, and digital transformation. Empirical studies investigating the impacts of digital transformation on organizational resilience are limited. Moreover, the existing research in the literature on the effects of intellectual capital on organizational resilience is quite new.

The study also revealed the importance of human capital and structural capital elements of intellectual capital, thus recommends that organizations in the healthcare industry should improve the human capital and structural capital by training their personnel and contributing to their skills and know-how to remain resilient in challenging, changing, and unstable environments. Moreover, successful implementation of digital transformation and application of digital technologies have significant benefits in maintaining and improving resilience in healthcare organizations.

The fact that this research contributes to the literature by investigating the effects of both digital transformation and intellectual capital on the resilience of organizations in the healthcare industry renders this study valuable.

6.1. Managerial Implications

Through adapting the business processes and structures developed with e-health and digital health applications in the healthcare sector, rapid decision making, and solutions can be achieved in extraordinary situations, and optimal management of the process can be achieved in these situations. Thus, by managing these processes well, it is even possible to restructure organizational capabilities and turn this situation into an opportunity.

For the healthcare organizations to maintain and improve their resilience, they need to evaluate and invest in their intellectual capital and implement the necessary improvements and appropriate organizational structures for digitalization in business processes.

This study revealed that when organizations operating in the healthcare industry encounter crises or unexpected challenging situations, digital transformation and intellectual capital components are very

important in overcoming the challenging situations. One of the findings of the study is that relational capital and innovative structural capital affect the rapidity of the organizations, thus, enable organizations to respond quickly in challenging situations.

In this context, to increase their resilience, organizations in the field of healthcare should increase the implementation of digital transformation by digitalizing their processes and increasing the use of the latest digital technologies, as well as increase knowledge of their employees, increase relational capital, especially by strengthening social networks and relationships with stakeholders, and support innovative structural and human capital investments.

6.2. Limitations and Recommendations

The fact that organizational resilience in the field of healthcare is examined in the context of the impacts of both digital transformation and intellectual capital makes this study valuable. At the same time, examining these relationships according to sub-dimensions in the study also contributes to the literature. The results of the research shed light on the literature in terms of the resilience of organizations operating in the field of healthcare in Turkiye.

It is a fact that digital transformation applications in the field of healthcare may vary depending on the departments of the organizations. Advances in computer-aided imaging and diagnosis methods used in the field of radiology, and improvements in robotic surgery applications in the field of surgery are among well-known examples. When evaluated from this perspective, evaluating digital transformation effects based on departments of healthcare organizations can be useful if studied in future studies.

In addition, considering that digital transformation and intellectual capital occur at different levels in different sectors, consequently, the resilience outcomes in other sectors may differ, applying the scales to other sectors and also by using larger data sets can be evaluated for future studies for generalizability of the results.

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APPENDICES

Appendix 1. Organizational Resilience Measurement

The organizational resilience scale, taken from Wicker et al. (2013), has four dimensions and total 21 items.

Item no	Dimension	Item Description
1	Robustness	Our organization has the capability to cope with the impact of unexpected incidents.
2	Robustness	Our organization has the capability to withstand external pressures.
3	Robustness	Our organization has the capability to cope with challenges.
4	Robustness	Our organization has the capability to withstand stress without losing focus.
5	Robustness	Our organization has the capability to continue to deliver its services during unexpected events.
6	Redundancy	Our organization has the capability to use other facilities when its own facilities cannot be used.
7	Redundancy	Our organization has the capability to re-allocate resources within the organization.
8	Redundancy	Our organization has the capability to substitute volunteers across positions.
9	Redundancy	Our organization has the capability to substitute equipment when its own equipment cannot be used.
10	Redundancy	Our organization has the capability to employ alternative options to sustain operations during unexpected events.
11	Resourcefulness	Our organization has the capability to prioritize tasks during unexpected events.
12	Resourcefulness	Our organization has the capability to generate revenue from multiple sources.
13	Resourcefulness	Our organization has the capability to mobilize resources during unexpected events.
14	Resourcefulness	Our organization has the capability to employ sufficient back up resources to sustain operations during unexpected events.
15	Resourcefulness	Our organization has the capability to identify problems during unexpected events.

16	Resourcefulness	Our organization has the capability to acquire support from other organizations when needed.
17	Rapidity	Our organization has the capability to achieve goals in a timely manner.
18	Rapidity	Our organization has the capability to adapt quickly to changing circumstances.
19	Rapidity	Our organization has the capability to meet priorities in a timely manner.
20	Rapidity	Our organization has the capability to restore services quickly during unexpected events.
21	Rapidity	Our organization has the capability to respond quickly to disruptive events.



Appendix 2. Digital Transformation Measurement

The digital transformation scale, taken from Nadeem et al. (2018) which consists of 12 items.

Item no	Item Description
1	Our organization has the ability to discover and use new technologies.
2	Digital transformation activities are included in the organization's value creation.
3	Improvements are made in the organizational structure, process, and competencies for digital transformation in our organization.
4	Our organization has taken action in response to digital transformation efforts and has the ability to finance the process.
5	Our organization's new leadership roles and management approaches facilitate the speed of digital transformation.
6	Our organization carries out strategic initiatives to create scalable, flexible and value-generating operations to realize digital transformation.
7	Our organization carries out strategic initiatives to leverage digital transformation to achieve better data optimization.
8	Our organization constantly carries out strategic initiatives to research and follow digital channels and technologies.
9	Our organization creates its basic strategies digitally within the framework of corporate competencies.
10	Our organization leverages the cooperation of partners and stakeholders for complementary competencies that include value preposition and revenue sharing.
11	Our organization creates intense interactive digital connections with domestic and foreign organizations.
12	Our organization provides a flexible and attractive working environment for employees who are born into the digital age.

Appendix 3. Intellectual Capital Measurement

The intellectual capital scale, taken from Wang et al. (2014), has 3 dimensions and total 17 items.

Item no	Dimension	Item Description
1	Human capital	Employees hold suitable work experience for accomplishing their job successfully in our organization.
2	Human capital	Employees of our organization have excellent professional skills in their particular jobs and functions.
3	Human capital	Our organization provides well-designed training programs.
4	Human capital	The employees of our organization often develop new ideas and knowledge.
5	Human capital	Employees are creative in our organization.
6	Structural capital	The overall operations procedure of our organization is very efficient.
7	Structural capital	Our organization responds to changes very quickly.
8	Structural capital	Our organization has an easily accessible information system.
9	Structural capital	Systems and procedures of our organization support innovation.
10	Structural capital	Our organization's culture and atmosphere are flexible and comfortable.
11	Structural capital	Our organization emphasizes new market development investment.
12	Structural capital	There is supportive among different departments in our organization.
13	Relational capital	Our organization discovers and solves problems through intimate communication and effective collaboration.
14	Relational capital	Our organization maintains appropriate interactions with its stakeholders.
15	Relational capital	Our organization maintains long-term relationships with customers.
16	Relational capital	Our organization has many excellent suppliers
17	Relational capital	Our organization has stable and good relationships with the strategic partners.