VILNIUS TECH
Vilnius Gediminas Technical University

12th International Scientific Conference

BUSINESS AND MANAGEMENT 2022

May 12–13, 2022, Vilnius, Lithuania

ISSN 2029-4441 / eISSN 2029-929X
ISBN 978-609-476-288-8 / eISBN 978-609-476-289-5
Article Number: bm.2022.880
https://doi.org/10.3846/bm.2022.880

NEW PERSPECTIVES ON MANAGEMENT AND RESILIENCE OF BUSINESS ORGANISATIONS *http://vilniustech.lt/bm*

WHAT IS THE RELATIONSHIP BETWEEN AGILE CAPABILITIES AND INNOVATION PROCESS?

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Received 05 March 2022; accepted 24 March 2022

Abstract. Today's business environments are described as very highly competitive and dynamic. To be successful in these uncertain environments, health care organizations must be agile in order to change their strategies and actions. Moreover, achieving success is related to developing the innovative capacity of an organization. The purpose of this research is to test the link between agility capabilities and innovation process in healthcare organizations in Western of Turkey. Based on a quantitative study with a sample of 169 nurse managers from the healthcare organization, the hypothesized relationships were verified. The data were analysed with SPSS. The results showed that there is a positive link between agility capabilities (competency, responsiveness, flexibility and quickness) and process innovation. The promotion and development of main capabilities of organization's agility can have a positive effect on innovation.

Keywords: healthcare organization, organizational agility, innovation process, agile capabilities, agile leadership.

JEL Classification: M54, M14, M21.

Introduction

Market competition increases pressure on companies to be innovative and develop new and efficient processes. Organizational agility has emerged as a critical business competency that may have a significant influence on financial and organizational results (Ravichandran, 2018; Naslund & Kale, 2020). According to empirical research, businesses that are capable of responding swiftly and innovatively to changes in their business environments have been able to enhance their performance (Wanasida et al., 2021).

The digital system and innovation give companies the opportunity to be flexible, but to be able to use them effectively, the right agility capacity is needed (Moi & Cabiddu, 2020). Developing the necessary conditions for organizational agility in creating innovations concerns the material and non-material potential of the organization. There are some researches about agility and information digital and innovation. Ravichandran (2018) investigated the independent and joint impacts of two main antecedents of organizational agility (a firm's IT competency and its innovation ability). Ravichandran (2018) discovered that a firm's innovation capacity is positively related to organizational agility and that organizations with higher innovation capacity are better equipped to exploit their digital platforms to improve agility. Wadhawa and Rao propose a new approach to flex-agility in which flexibility becomes a platform to boost system agility (responsiveness) for modern organizations seeking IT-facilitated long-term competitiveness (Wadhawa & Rao, 2003). They emphasized the need of flexibility and agility in achieving innovative synergy. These agile capabilities are critical for business informational management (Begüm, 2022).

Today's business settings are described as very dynamic and competitive. In these situations, organizations should be more flexible and have agile capabilities in order to adjust their plans and actions in order to be successful. Many organizations try to quickly cope with changes in the operating environment through innovation. The innovative capacity and process of an organization, especially, are essential in enabling dynamism and agility in adapting to changes in the environment and technology. It is stated that technology may help businesses become more agile (Ravichandran, 2018; Younus

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& Abumandil, 2021; Shams et al., 2021), there are limited researches about agile capabilities and innovation process especially in health care organizations. Thus the aim of this study is to investigate the relationship between agile capabilities and innovation process in health care organizations. In other words, we theorize/hypothesis that the agility capabilities (Competency, Responsiveness, Flexibility and Quickness) are correlated to the innovation process in health care organizations. To test our hypotheses, we collected data from the 169 nurse managers from Turkish healthcare organizations by scales. We used SPSS statistical software (version 23) for all statistical analyses.

1. Theoretical background

1.1. Organizational agility and agility capabilities

Organizational agility is a skill that enables businesses to respond to environmental changes (Akkaya & Tabak, 2020; Abdelilah et al., 2018). Firms' capacity to alter their activity systems to increase their potential, and it may boost their performance in dynamic situations when the plan of action is unknown. Such agility necessitates both internal and structure flexibility and agility in the firm's resources available for deploying the resources (Darvishmotevali et al., 2020; Ahmed et al., 2019; Sangari & Razmi, 2015). Organizational agility is described as a company's ability to respond quickly to both expected and unexpected changes in its internal and external business environments (Akkaya, 2021).

Sharifi and Zhang (2001) proposed an organizational agility model for business. It has four main capabilities, such as responsiveness, flexibility, quickness, and competency which show that a company is organizationally agile or not. This model has been confirmed by some empirical studies (Lin et al., 2006; Mohammadi et al., 2015).

Responsiveness – because of technological and environmental developments, customer preferences and demands may vary over time. Organizations that adapt to problems by having a broad market/product domain and leading industry transformation may be able to respond to challenges (Holweg, 2005; Nwanzu & Babalola, 2019).

A company's flexibility implies being able to adjust to environmental changes in order to discover the greatest potential scope and to continually react to unanticipated developments (Sanchez, 1997; Apostu et al., 2021). It should be highlighted that agility enables businesses to modify their own structure and capital to adapt to change.

Quickness is a concept that firms should be able to readily implement choices after they have decided to respond to the changes (Gunasekaran & Yusuf, 2002). This is the capacity to adapt swiftly to changes in the business environment and to quickly create new knowledge and skills (Shahaei, 2008). The competence dimension may be defined as the capacity to apply the other three organizational agility abilities stated above (Akkaya & Tabak, 2020). Competency requires the ability to refresh existing or future abilities in order to adapt a firm to environmental changes (Sharifi & Zhang, 1999).

1.2. Innovation process

Innovation is considered one of the ways of surviving organization in a turbulent, uncertain, changing, and increasingly competitive environment. Organizations operating in this environment are forced to be innovative and improve their performance (Chen et al., 2014). Innovation is also a way to achieve a competitive advantage (Martin-de-Castro et al., 2013; Zhao et al., 2021), be successful (Verde et al., 2015), meet the expectations and needs of customers (Anning-Dorson, 2017).

Innovation is new or improved service or delivery methods, which may involve improvements in processes, equipment, or software (Habidin et al*.,* 2015). Each innovation is creating something new (González-Benito et al., 2016) and implementing the developed new solutions in practice (Buenechea-Elberdin et al., 2018).

Several types of innovation are mentioned in the literature. According to the typology contained in the Oslo Manual, four types of innovation are distinguished (Oslo Manual, 2008, pp. 50–64):

Product innovation consisting in the introduction of a product or service that are new or significantly improved in terms of their functional or utility features (including significant improvements in terms of technical specifications, components and materials, embedded software, ease of use or other functional features), and in the case of the service sector, related to the introduction of significant improvements in the way of delivering services (increasing the efficiency or speed of their provision), adding new functions or features.

Process innovation, made in order to lower the unit costs of production or delivery, increase the quality and production or delivering new or significantly improved products, related to the implementation of a new or significantly improved method of production or delivery of a product (changes in technology, devices and / or software), and in the case of services – a new or significantly improved method of creation and rendering services (significant changes to the hardware and software used in service companies or to the procedures or techniques used to provide services).

Marketing innovation, which consist in the implementation of a new marketing method involving significant changes in the design / structure of the product or in the packaging, distribution, promotion or pricing strategy, undertaken in order to better meet customer needs, open new markets or new positioning of the company's product in the market to increase sales.

Organizational innovation meaning the use of such a method organizational (in the operating principles adopted by the company, in the organization of the workplace or in relations with the environment), which has not been applied so far, results from taking strategic decisions aimed at achieving better results by reducing administrative costs or transaction costs, increasing the

level of satisfaction with labor (and thus labor productivity), gaining access to non-traded assets (such as uncoded external knowledge), and reducing delivery costs.

The concept of innovation in health care is defined as adoption and implementation of such methods of operation, practices, the effectiveness of which has been confirmed and will affect the results of the entire organization, at the same time ensure safety and generate the best results for patients, while these changes are to help employees focus on patients, act faster, better and more efficiently (Thakur et al., 2012, p. 564). Thus, innovations in healthcare organizations may concern the introduction of a new or significantly modified service, the design and implementation of changes in the relationship between the service provider and the recipient, methods of service provision, the use of modern techniques and technologies, the development and implementation of innovative changes in the area of marketing, logistics, etc. (Małkowska, 2014; Jończyk, 2013). This definition indicates that health service organizations, like other entities, can try to be innovative and strive to introduce innovative processes and solutions in their activities.

Introducing innovations in an organization can bring many economic and organizational benefits. Innovation process refers to increasing the efficiency or effectiveness with which an organization operates (Wu et al., 2021). Innovation process can increase the profit and value of firms (Khazanchi et al., 2007; Tsinopoulos et al., 2017; Hysa et al., 2020). The results of process innovation are, for example, reducing costs by improving the efficiency of operations (Un & Asakawa, 2015), increasing the price – cost margin (Fritsch & Meschede, 2001; Kumar et al. 2021), improving the quality of service (do Carmo Caccia-Bava et al., 2009).

Innovation "is not directly available to all organisations at all times, but only to firms with the appropriate internal characteristics" (Aragón-Correa et al., 2007, p. 356). Therefore, it is very important to learn about the organization's improvement methods that will allow for the development and implementation of innovations.

1.3. Agility capabilities and innovation process

Patients and guests' information and feedback support healthcare organisation to improve their services quality and increase productivity, prestige, and preference. Furthermore, Reichstein and Salter (2006) stated that process innovation is an essential source of increasing productivity and enabling companies to gain competitive advantage, as well as an important component in innovation strategy. Due to Covid-19 pandemic, healthcare organizations have become more critical and important for better and quality life. This situation increased the number of private and public healthcare organization, therefore, has created a serious competition between health institutions. To sustain their existence, healthcare organizational should adapt the changes in environment and meet patients and guests' expectations at right time and place. Furthermore, organizations with a greater innovation process may be more receptive to new ideas, putting them in a better position to recognize market possibilities and bring new service and goods to market faster than competitors. In other words, organization should be agile, exploit agile capabilities and be innovative.

It simpler for healthcare organizations with strong innovation capacity to build the resource bundles required to bring new service to market of healthcare.

The innovative potential of an organization is, on the one hand, the resources and technological solutions possessed by the organization. On the other hand, the potential of the organization is created by intangible resources: employees' skills, the ability to create new knowledge, creativity (Bulińska-Stangrecka & Bagieńska, 2020). These potential forms the basis of competences necessary to make quick decisions resulting from changes in the operating environment. It is also indispensable in the process of creating innovations (Dyhdalewicz & Grześ-Buklaho, 2021). Responsiveness of the organization means reacting to changes and challenges in a way that first takes into account the preferences of the consumer and service recipient and brings benefits to the company. Thus, it is the creation of innovative solutions /processes that have a positive impact on the company's results (Anning-Dorson & Nyamekye, 2020; Siano et al., 2020).

Process innovations sometimes require changes in the organizational structure caused, for example, by the implementation of technology (Lichtenthaler, 2016). Flexibility, which enables companies to modify the structure and adapt capital to changes, can be a factor supporting process innovation in the organization. The ability to quickly adapt to changes in the business environment and to quickly create new knowledge is essential in the functioning of modern enterprises. Leadership plays an important role in this process (Akkaya, 2021). The literature emphasizes that organizations need agile leaders to implement agility practices (Şahin & Alp, 2020). Process innovation is an improved way of performing tasks in order to increase efficiency and quality of service. The quickness of reacting to changes may be a factor determining the innovativeness of applied solutions.

Therefore, we correlate the relation between agility capabilities (Competency, Responsiveness, Flexibility and Quickness) and the innovation process in health care organizations (Figure 1).

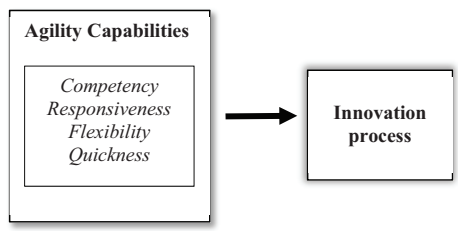

Figure 1. Research model (source: own elaboration)

To understand the relationship, the following hypotheses will be tested:

H_1: There is a positive relationship between competency and innovation process at ($p < 0.05$) level.

H_2: There is a positive relationship between responsiveness and innovation process at ($p < 0.05$) level.

H_3: There is a positive relationship between flexibility and innovation process at ($p < 0.05$) level.

H_4: There is a positive relationship between quickness and innovation process at ($p < 0.05$) level.

2. Methodology

Generally, innovation is applied to the product rather than the process or service. However, process innovation within the organization has been shown to have an influence on organizational performance. Likewise, the purpose of this research is to put organizational agility and process innovation to the test in the Turkish healthcare organizations. Healthcare organizations were chosen because the need for improvement innovation process, as well as performance and agility assessment, is critical in this sector. To achieve the purpose of this study, nurse managers in Turkish healthcare organizations were proposed as the population.

2.1. Data

The present study used a quantitative approach to test the recommended hypotheses in research model. The data was collected from the 169 nurse managers over the period of 3 months from June till August 2021, using a cross-sectional survey questionnaire. The sample size was selected based on Comrey and Lee (1992) inferential statistics.

2.2. Measures

The scale was divided into 3 sections, the first section was regarding demographic information of nurse managers like gender, work time, employee number etc. The questions about nurse managers' perceptions of organizational agility at healthcare organization, was contained in section two. Agility Capabilities scale was developed by Sharifi and Zhang (1999) and adapted to Turkish by Akkaya and Tabak (2018). It has 17 items. (Competency, 8 items; Responsiveness, 3 items; Flexibility 3 items and Quickness, 3 items). The third section is about Innovation Process developed by Wang and Ahmed (2004) and has 4 items. To measure the items of corresponding variables, a standardized five-point Likert scale was used to organize the scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

2.3. Analytical method

This study was designed to utilized quantitative method approach to determine the effect of organizational agility on innovation process. Pearson correlation was used for the examination of causal relationship between variables. We used SPSS statistical software (version 23) for all statistical analyses.

3. Results

Reliability is the degree of internal consistency between multiple measurements of a variable and Cronbach's alpha is the most commonly used measure to assess the reliability and the scores above 0.7 is acceptable (DeVellis, 2016). Table 1 shows the factors, the number of items in each capabilities and the value of Cronbach's alpha.

Table 1. Scale Names, Sample Items and Reliability (source: own elaboration)

Scale Name	No. of items	Cronbach's Alpha
Competency	8	0.935
Responsiveness	3	0.907
Flexibility	3	0.885
Quickness	3	0.840
Innovation Process	4	0.805
Total Scale	21	0.956

Before analysing the data, it is necessary to check some statistical values for adequacy of the data and normal distribution. For conducting parametric tests such as correlation, the distribution of data should be normal. The value of Skewness and Kurtosis values must be between +1 and –1 (George & Mallery, 2012). When checking Table 2, it is seen that Skewness and Kurtosis values are between +1 and –1. Therefore, parametric analysis tests were applied in this research. When checking the mean of factors, the factor with the highest average is competency while the factor with the lowest is quickness.

Table 2. Descriptive Statistics and Test of Normality (source: own elaboration)

	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Competency	3.2315	0.07239	0.94103	0.001	0.187	–0.894	0.371
Responsiveness	3.2485	0.08295	1.07830	–0.085	0.187	–0.846	0.371
Flexibility	3.0217	0.07839	1.01909	0.063	0.187	–0.911	0.371
Quickness	2.6943	0.08154	1.05999	0.206	0.187	–0.908	0.371
Innovation Process	3.0133	0.07303	0.94933	0.127	0.187	–0.739	0.371

Note: N statistic = 169.

Table 3. Correlation Matrix (source: own elaboration)

		Competency	Responsiveness	Flexibility	Quickness	Innovation Process
Competency	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	169				
Responsiveness	Pearson Correlation	0.789**	1			
	Sig. (2-tailed)	0.000				
	N	169	169			
Flexibility	Pearson Correlation	0.750**	0.777**	1		
	Sig. (2-tailed)	0.000	0.000			
	N	169	169	169		
Quickness	Pearson Correlation	0.676**	0.674**	0.709**	1	
	Sig. (2-tailed)	0.000	0.000	0.000		
	N	169	169	169	169	
Innovation Process	Pearson Correlation	0.656**	0.666**	0.727**	0.718**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	169	169	169	169	169

Note: ** Correlation is significant at the 0.01 level (2-tailed).

Pearson Correlation analysis was used to calculated and test the relationship between agility capabilities (Competency, Responsiveness, Flexibility and Quickness) and innovation process in current research.

According to Table 3, Flexibility has a high level and significant correlation with innovation process ($r = 0.727$, $p < 0.01$).

Responsiveness has a high level and significant correlation with innovation process ($r = 0.666$, $p < 0.01$).

Competency has a high level and significant correlation with innovation process ($r = 0.656$, $p < 0.01$).

Quickness has a high level and significant correlation with innovation process ($r = 0.718$, $p < 0.01$).

Discussion and Conclusions

The main objective of the current study was to explain the relationship between organizational agility capabilities and innovation process. Consistent with previous studies (Ravichandran, 2018; Wanasida et al., 2021; Brand et al., 2021), the findings indicate that organizational agility has an impact on the innovation process in healthcare organizations.

It is stated that there is currently limited research evaluating the relative effectiveness of technologically innovative activities such as process innovation in service organizations (Kim & Suh, 2011). Customers, patients, and guests are increasingly worried about the quality of their healthcare. To fulfil this need, the healthcare organizations should work to enhance their current product or service by incorporating innovation into their processes. In literature, it is very difficult to find previous studies that examine the relationship between process innovation and organisational agility in the healthcare organizations. Thus, this current research is critically important for future research. Our study adds to the process of innovation research by conceptualizing and measuring organizational agility in terms of four dimensions and linking process innovation to organizational agility and its four dimensions that providing empirical evidence to support this relationship. The empirical results provide specific actionable guidance for health care managers on how to increase their innovation process through organization agility.

This study found that agility capabilities have a significant positive impact on innovation process in a healthcare organization. Moreover, this research found that agile healthcare organizations with higher flexibility were able to leverage their organization agility to a greater extent in enhancing their innovation process. In essence, this study helps managers interested in implementing innovation and promoting agile organizational capabilities.

Further research is needed to show what specifically nurse managers need, and what position should be taken to decision making for innovation process.

The research was designed as a quantitative study therefore it cannot provide a qualitative view to the subject of the research. This is another limitation, therefore, in the future, a qualitative or a mixed method study would be necessary. However, the reasonability of the critical levels of Competency, Responsiveness, Flexibility, Quickness are not analysed in current study. Apparently, these are the others limitations of the study and should be investigated in future researches.

Funding

This work was supported by the Bialystok University of Technology [grant number WZ/WIZ-INZ/1/2020].

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