

DOES ADHOCRACY ORGANIZATIONAL CULTURE MEDIATE THE ENVIRONMENTAL DYNAMISM – INNOVATIVENESS RELATIONSHIP?

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ABSTRACT Based on the competing values theory of organizational culture, this paper aims to investigate the influence of environmental dynamism on innovativeness in the information and communication technology (ICT) sector. Moreover, it assumes that the cultural orientation of adhocracy mediates the relationship between environmental dynamism and innovativeness. The sample consists of 38 ICT companies from Split, Croatia, which participated in the survey. The data was collected using a questionnaire and analyzed using PLS-SEM (Partial Least Squares Structural Equation Modeling). The results have shown a partial mediation of adhocracy cultural orientation, which means that environmental dynamism affects innovativeness not only directly but also through adhocracy cultural orientation.

KEYWORDS: *adhocracy orientation; environmental dynamism; innovativeness; ICT sector; mediation; organizational culture*

1. INTRODUCTION

Although the concept of innovativeness has been the focus of academic interest and empirical research (Keupp et al., 2012), the literature analyzing the antecedents of innovativeness is scarce, and the majority of studies focus on the outcomes of innovativeness (Lee & Hsieh 2010; Parra-Requena et al., 2020; Tatkonda & Montoya-Weiss 2001; Farida & Setiawan, 2022; Arici & Gok, 2023). There is not enough empirical research that demonstrates which conditions and behaviours lead to the development of innovativeness within the firm, although the study of processes that support innovation is relevant for practitioners

and researchers (Zeb et al., 2021).

In a dynamic environment where buyers' preferences and needs change frequently, strategies implemented by competitors are unpredictable, and technology is constantly evolving, the ability to innovate is a crucial determinant for achieving a sustainable competitive advantage. To succeed in these conditions, a company must be more innovative than its competition (Story et al., 2014). Naranjo-Valencia et al. (2020) highlighted that the influence of the environment on innovation capability should be researched more intensively.

If a company wants to develop innovativeness, it should also foster an organizational culture that fo-

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cuses on managing change (Brettel et al., 2015). Since organizational culture can influence innovativeness (Kumar et al., 2024) and is critical for successful innovation (Buschgens et al., 2013; Naveed et al., 2022), it must strongly support innovation (Santos-Vijande & Alvarez-Gonzalez, 2007; Kucharska, 2021). Organizational culture affects the speed and frequency of innovation (Maher, 2014); it should motivate innovative behavior and convince employees that innovation is an important organizational value (Szczepańska-Woszczyzna, 2014; Rizhamadze et al., 2020). Employees will desire to find their assigned role and engage in innovative activities only if they strongly identify with the organization (Szczepańska-Woszczyzna, 2014). Although the importance of organizational culture for a company's innovativeness is undeniable, research in this area is somewhat incomplete. In general, the relationship between innovativeness and organizational culture was empirically confirmed (Lau & Ngo, 2004; Hernandez-Mogollon et al., 2010; Sanz-Valle et al., 2011; Lin et al., 2013; Bendak et al., 2020), but the majority of the studies only investigate the impact of specific elements of organizational culture on innovativeness (Cabello, Carmona & Valle, 2005; Engelen, 2010; Laursen, 2002; Menor & Roth, 2007). Suifan (2021) also discusses innovativeness as a mediator in the impact of organizational culture on performance. Tellis et al. (2009) highlighted the need for additional empirical research linking organizational culture with innovation, and Naranjo-Valencia et al. (2019) stated that empirical analysis of the influence of different types of organizational culture on innovativeness is needed.

Brettel et al. (2015) emphasized the need for research that examines how companies adapt to respond to environmental changes (innovativeness) and how the industry affects organizational culture. Although in Nonaka's (1994) knowledge creation theory, culture was never an antecedent (Oyemomi et al., 2019), based on all previously elaborated, the main aim of this paper is to test if organizational culture mediates the influence of environmental dynamism on innovativeness. Moreover, based on the recommendations by Azeem et al. (2021), this research focuses on the interplay between organizational culture and innovativeness in the information and communication technology (ICT) industry.

The first part of the paper describes the theoretical aspects of this study and develops hypotheses. Next, the methodology is presented, including the development of the survey, the research framework and the operationalization. The following results section is followed by a discussion, implications, limitations, and areas for further research.

2. THEORY AND HYPOTHESES

Innovation is any idea, way of operating, or product perceived as new by an organization or an individual. It refers to the introduction of new products and processes to increase the success of a company and is one of the main challenges in managing ICT companies. Numerous studies have concluded that innovation is a factor that contributes to greater success in most industries (Zahra, Nielsen & Bogner, 1999; Fari-da & Setiawan, 2022; Arici & Gok, 2023).

Innovativeness is the tendency of an organization to innovate (Ruba et al., 2023). According to Wang and Ahmed (2007), it defines the link between an organization's assets and competencies and the market in which it operates. It should help a company to generate and utilize ideas and knowledge and transform them into new products, services and processes (Lawson & Samson, 2001; Robertson et al., 2012). There are several dimensions of innovativeness, and they can include the development of new products or markets, or behaviours, processes, and strategic orientations that are innovative (Lawson & Samson, 2001; Miller & Friesen, 1983; Saunila et al., 2014; Wang & Ahmed, 2007).

Globalization, increased competition, rapid technological development and changes in organizational structure, the diversity of the workforce, new demands, and changes in the market and economic conditions all contribute to the complexity of the company's environment. A dynamic environment is characterized by numerous changes in the preferences and needs of buyers and the unpredictable implementation of new strategies by competitors. It is determined by the number and type of changes as well as the character and predictability of the changes. For a company to be successful in a dynamic environment, it should have a higher level of innovativeness than its competition (Story et al., 2014).

Although the relationship between innovativeness and environmental dynamics is still debated (Ferreira et al., 2020), there is consensus that the importance of innovativeness depends upon the characteristics of the environment (Szymanski, Kroff & Troy, 2007) and is probably most important in dynamic environments (Delmas, 1999; Karna et al., 2016; Schilke, 2014; Wu, 2010). Gemici & Zehir (2023) elaborate on environmental turbulence as an antecedent in the context of innovativeness, as innovation of products and services depends upon the external environment and a dynamic environment should positively influence an innovation (Story et al., 2014). Based on that, hypothesis H1 is proposed:

H1: Environmental dynamism has a positive influence on a company's ability to innovate.

Organizational culture encompasses shared values, beliefs, and assumptions that enable the organization to function (Denison, 1996). Therefore, organizational culture is a unique characteristic that sets companies apart. It is the result of a long-term process and remains in the company even when its creators are no longer there.

In this paper, organizational culture is analysed using the Competing Values Framework (CVF) developed by Cameron and Quinn (1999). The CVF has two dimensions, one relating to formal and informal processes and the other to strategic orientation. Formal processes are described by high degrees of stability, control, and order, while informal processes involve a high degree of flexibility. The strategic focus has two distinct elements: internal integration and external adaptation. On this basis, CVF identifies the following cultural orientations: clan, adhocracy, hierarchy, and market orientation, which are characterized by either an external or internal focus and either flexibility or stability. The clan orientation is internally oriented and flexible. It focuses on the relationships between people. It emphasizes teamwork, cohesion, participation, and commitment. The adhocracy orientation is externally oriented and flexible. This orientation is focused on growth, flexibility, entrepreneurship, change, and adaptation. The hierarchy orientation is internally oriented and focused on stability. It emphasizes stability, formalization, and control. The market orientation is externally oriented but stable. It is focused on achieving clear goals, competitive actions, and reactions (Cameron & Freeman, 1991; Yarbrough et al., 2010). However, emphasizing one of the cultural orientations does not mean that other orientations are unimportant or less developed. Organizational culture is a hybrid, usually a combination of all the above-mentioned cultural orientations (Yarbrough et al., 2010). Different types of organizational culture can have a significant impact on a company's ability to innovate (Liao et al., 2012). The CVF assumes that a flexible organizational culture should promote innovativeness, as flexibility facilitates innovation, while stability can block innovation. Furthermore, it is assumed that it is easier for companies with externally oriented cultures to be innovative, as internally-oriented cultures often lack the focus on market changes that can be important for the innovation process. On the other hand, externally oriented cultures can access important external information more easily and thus facilitate innovation (Leal-Rodriguez et al., 2019; Naranjo-Valencia, et al., 2020).

Based on that, we can conclude that adhocracy

culture should be the most important for innovativeness, which is also confirmed in recent studies (Leal-Rodriguez et al., 2019; Naranjo-Valencia et al., 2020; Zeb et al., 2021). Due to its focus on flexibility, innovation, change, and adaptation, this cultural orientation is also likely to be crucial for success in industries characterized by dynamic environments, such as the ICT industry. The adhocracy culture is outward-looking and characterized by a high degree of creativity, commitment, experimentation, and change (Naranjo-Valencia et al., 2011). Employees are encouraged to innovate and experiment. The adhocracy culture fosters change efforts. New ideas are encouraged and the organizations employ flexible governance to enable creativity and change (Zeb et al., 2021). It creates a dynamic and creative work environment and considers innovation and risk-taking as common practices. It is about gaining new capabilities to develop products that stand out and create competitive advantage through adaptation and new ways of doing things (Azeem et al., 2021). According to Leal-Rodriguez et al. (2019), adhocracy is the most innovation-oriented typology. Furthermore, according to Kuhn and Bhatiasevi (2024), adhocracy culture is important for innovativeness. It is, therefore, expected that:

H2: Adhocracy cultural orientation has a positive influence on a company's ability to innovate.

The business environment is constantly changing. Companies that want to remain successful and maintain the competitive advantage they have achieved must adapt by cultivating an organizational culture that encourages the implementation of change (Abbass, 2003). Adhocracy organizational culture enables companies to respond quickly to changes in the external environment (Leal-Rodriguez et al., 2019), therefore:

H3: Environmental dynamism has a positive effect on the development of adhocracy cultural orientation.

Ravasi and Schultz (2006) emphasize the importance of organizational culture in the formation of corporate identity and orientation toward innovation in dynamic environments. Based on all previously said, we propose:

H4: Adhocracy cultural orientation mediates the effect of environmental dynamism on innovativeness.

3. METHODOLOGY

An anonymous survey was conducted as the primary data collection method. The data was collected using a questionnaire with closed-type questions. ICT companies based in Split were asked to participate. The questionnaire was sent to 119 companies, and thirty-eight usable questionnaires were collected in August 2022, which corresponds to a response rate of 31.93%. The questionnaire consists of four sections. The first part describes the characteristics of the participants, while the following sections were dedicated to the organizational culture, environmental dynamism, and innovativeness. To operationalize organizational culture, the items were adopted from Yarbrogth et al. (2010), while the operationalization of environmental dynamism and innovativeness was adopted from Story et al. (2014) (Table 1). All variables are rated on a 7-point Likert scale.

PLS-SEM was used to test the measurement model and the proposed hypotheses because it is

more flexible than covariance-based structural equation modeling (CB-SEM) in terms of the multivariate normality criterion and sample size.

4. RESULTS

A path analysis was conducted to test the measurement model and evaluate the proposed hypotheses. The analysed variables are reflective in nature, and their reliability and validity were tested. Table 2 and Table 3 present the results of the analyses performed.

Internal consistency was tested using Cronbach's alpha. The values for all variables are above a minimum value of 0.7 (Hair, Black, Babin & Anderson, 2010). The same applies to the composite reliability (CR). Hensseler, Hubona and Ray (2016) point out that Rho_A is also examined in the PLS to test reliability. According to the results from Table 2, the Rho_A values are above the acceptable value of 0.7 (Hensseler et al., 2016). In addition, in this study, Cronbach's

TABLE 1. Constructs

Constructs	Items	
Environmental dynamism (Story et al., 2014)	DYN1	Competitors are constantly trying out new competitive strategies.
	DYN2	Customers' needs and demands are changing rapidly in our industry.
	DYN3	New markets are emerging for products and services in our industry.
Adhocracy cultural orientation (Yarbrogth et al., 2010)	OC_A1	This is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.
	OC_A2	The head of this company is generally considered to be an entrepreneur, an innovator, or a risk taker.
	OC_A3	The glue that holds us together is our commitment to innovation and development. There is an emphasis on being first.
Innovativeness (Story et al., 2014)	IN_I1	On average, we launch more new products/services in our target markets each year than our main competitors in the target markets.
	IN_I2	Industry experts would say that we are more productive in launching new products/services in our target markets.
	IN_I3	Our main competitors in our target markets cannot keep up with the rate at which we launch new products/services in our target markets.
	IN_N1	Compared to our main competitors, the products/services we offer in our target market(s) are radical.
	IN_N2	Compared to our main competitors, the products/services we offer in our target market(s) are creative.
	IN_N3	Compared to our main competitors, the products/services we offer in our target market(s) are inventive.

SOURCE: Secondary data

TABLE 2. Reliability and convergent validity of constructs

Constructs	Items	Factor loadings	Cronbach's alpha	Rho_A	CR (Composite reliability)	AVE (Average variance extracted)
Environmental dynamism	DYN1	0.810	0.815	0.814	0.890	0.730
	DYN2	0.884				
	DYN3	0.868				
Adhocracy cultural orientation	OC_A1	0.928	0.911	0.928	0.944	0.849
	OC_A2	0.907				
	OC_A3	0.929				
Innovativeness	IN_I1	0.719	0.885	0.891	0.914	0.641
	IN_I2	0.850				
	IN_I3	0.649				
	IN_N1	0.885				
	IN_N2	0.854				
	IN_N3	0.822				

SOURCE: Secondary data

alpha, CR, and Rho_A are greater than 0.8, which proves that the reliability of the constructs has been achieved. The AVE values are above 0.6, which means that convergent validity is confirmed (Table 2).

Discriminant validity was tested using the Fornell-Larcker (1981) criterion. According to the Fornell-Larcker criterion, the square root of the AVE should exceed the correlation between all other constructs. Table 3 shows that discriminant validity is ensured for all variables.

Structural relationships were analysed with the bootstrapping method using 500 subsamples. Mediation was tested in accordance with Hair et al. (2010). After demonstrating a significant relationship between environmental dynamism and innovativeness (0.573), the significance of the relationship between environmental dynamism and adhocracy cultural orientation (0.329) was confirmed. A significant correlation was also found between the adhocracy cultural orientation and innovativeness (0.684). Then, the direct impact of environmental dynamism on innovativeness was analysed ($\beta=0.601, p<0.001$), and proven to be significant, confirming the hypothesis H1. Then, the second model, which added the mediation

of adhocracy cultural orientation, was tested (Figure 1).

The influence of adhocracy cultural orientation on innovativeness was found to be significant and positive ($\beta=0.556, p<0.001$), supporting hypothesis H2. The influence of environmental dynamism on adhocracy cultural orientation was also significant ($\beta=0.329, p<0.001$), confirming hypothesis H3. After including adhocracy cultural orientation in the model, the impact of environmental dynamism on innovativeness decreased significantly ($\beta=0.390, \text{delta } \Delta\beta=-0.11$). The explained variance of innovativeness (endogenous construct) increased to 0.604 ($\Delta R^2=0.243$). On this basis, the partial mediation of adhocracy cultural orientation on the impact of environmental dynamics on innovativeness was confirmed (Figure 1). This has led to the confirmation of hypothesis H4. The mediated model shows that the direct effect of environmental dynamism on innovativeness is 0.390; the indirect effect is 0.183, and the total effect is 0.573.

To validate the PLS structural model, the global goodness-of-fit (GoF) was calculated according to Tenenhaus et al. (2004) and Tenenhaus et al. (2005), which is 0.668 for the mediated model.

TABLE 3. Fornell-Larcker criterion

	Adhocracy cultural orientation	Environmental dynamism	Innovativeness
Adhocracy cultural orientation	0.921		
Environmental dynamism	0.329	0.855	
Innovativeness	0.684	0.573	0.801

SOURCE: Research results

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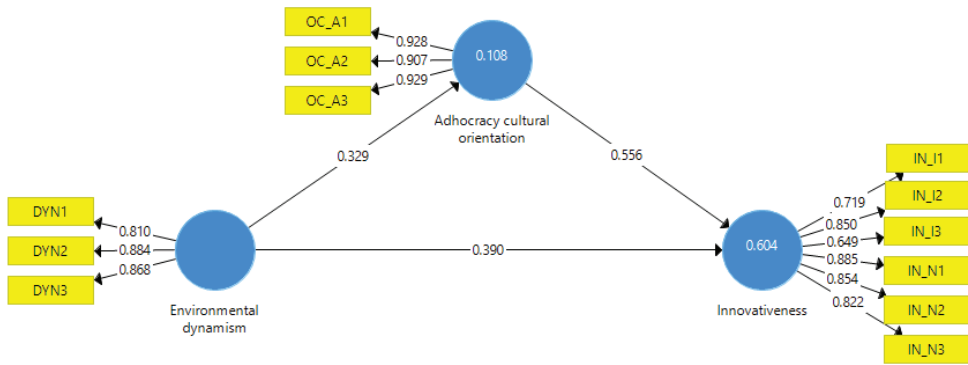


FIGURE 1. Structural model

5. DISCUSSION

The ability to innovate has become one of the central topics studied in depth, both theoretically and empirically, in the field of strategy. Different researchers have analysed the positive effects of innovativeness (Chang et al., 2014; Sher & Yang, 2005), but empirical studies on fostering innovativeness in organizations are rare. Particularly scarce are studies that examine the influence of organizational culture on innovativeness, while studies that include the role of environmental dynamism are virtually non-existent. These shortcomings were attempted to be addressed in this study.

Four hypotheses are proposed and analyzed. First, the impact of environmental dynamism on innovativeness was found to be direct, significant, and positive, confirming H1. This shows that innovativeness has a contingent nature, meaning that it is likely to be more important and more developed when the company operates in an unpredictable environment. This is particularly important for ICT firms as they operate in a dynamic environment that changes rapid-

ly and where technology is constantly evolving. This means that the company's ability to innovate has a significant impact on its competitiveness.

Second, the impact of adhocracy cultural orientation on innovativeness was also confirmed as significant and positive, whereas H2 was accepted. This is in line with the research findings of Yarbrogh et al. (2010), which demonstrated that companies that emphasize above-average innovation have a highly developed organizational culture, as well as with research findings proving that adhocracy cultural orientation positively influences innovativeness (Brettel et al., 2015; Leal-Rodriguez et al., 2019; Naranjo-Valencia et al., 2020; Zeb et al., 2021; Kuhn & Bhatiasavi, 2024). The confirmation of H2 shows that in order to be innovative, companies need to foster an organizational culture that emphasizes change, new ideas, improvement, and flexibility.

The impact of environmental dynamism on adhocracy cultural orientation was significant and positive, so H3 was also accepted, which means that companies whose environment is highly dynamic, are likely to develop an organizational culture focused

on adaptation, change, innovation, and flexibility to adapt to environmental changes.

The mediation of adhocracy cultural in the environmental dynamism-innovativeness relationship was also significant, confirming hypothesis H4. The mediation took place as the direct impact of environmental dynamism on innovativeness became weaker, and the total explained variance in the innovativeness variable increased significantly after adhocracy cultural orientation was included in the model. Although previous studies suggested that adhocracy culture promotes organizational innovation (Brettel et al., 2015; Naranjo-Valencia et al., 2016; Leal-Rodriguez et al., 2019; Naranjo-Valencia et al., 2020; Zeb et al., 2021), they did not include environmental dynamism into the model. Moreover, this is the first study that tested the mediation of organizational culture on the influence of environmental dynamism on innovativeness.

This is particularly important for ICT companies. The organizational culture of ICT companies differs from other industries, mainly because of the specific ICT experts work and collaborate. Technological development brings with it new business practices; large tasks are divided into smaller teams where communication is much faster and more efficient. As a result, companies are better prepared for unpredictable and sudden changes. The culture of innovation is an essential prerequisite for the development and implementation of new ideas. Organizational culture can promote the motivation to innovate by emphasizing the importance of innovation for the organization and defining innovative behaviour (Hartmann, 2006).

6. CONCLUSION

The empirical findings of this paper can clarify the role of organizational culture in innovation. This research can serve all ICT companies and companies with similar activities to understand and change the companies' organizational culture and use new insights and techniques that can help them in the long run. The contribution of this study is that it highlights not only the need for a developed organizational culture but also the need for an organizational culture that promotes innovation and change.

Even though this study contributes to the understanding of organizational culture and innovativeness, there are some important limitations that should be noted. The data in this study are from companies operating in Split, Croatia. The results should be viewed with caution as they may be different in the context of other countries (Engelen, 2010; Menor & Roth, 2007). Furthermore, the results may differ depending on the industry, especially for companies with a less dynamic environment. Subsequent studies could focus on other sectors or countries and uncover contextual differences. The following methodological limitation of the study relates to the limited sample size, an issue that can be addressed in further research. Future research could also move towards longitudinal studies and investigate the relationships between the studied components over time. In future studies, a qualitative research approach could be used to identify other potential determinants of innovativeness or other aspects of organizational culture that may be important in promoting a firm's innovativeness.

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POSREDUJE LI ADHOKRATSKA ORGANIZACIJSKA KULTURA ODNOS IZMEĐU DINAMIKE OKOLINE I INOVATIVNOSTI?

SAŽETAK

Temeljem teorije konkurentnih vrijednosti organizacijske kulture, ovaj rad istražuje utjecaj dinamike okoline na inovativnost u sektoru informacijskih i komunikacijskih tehnologija (IKT). Nadalje, pretpostavlja se da kulturna orijentacija adhokracije posreduje odnos između dinamike okoline i inovativnosti.

Uzorkom je obuhvaćeno 38 IKT poduzeća iz Splita, Hrvatska, koja su sudjelovala u istraživanju. Podaci su prikupljeni putem upitnika i analizirani metodom PLS-SEM (modeliranje strukturnih jednadžbi parcijalnim najmanjim kvadratima). Rezultati su pokazali djelomično posredovanje kulturne orijentacije adhokracije, što znači da dinamika okoline utječe na inovativnost ne samo izravno, već i putem kulturne orijentacije adhokracije.

KLJUČNE RIJEČI: *orijentacija adhokracije; dinamika okoline; inovativnost; IKT sektor; posredovanje; organizacijska kultura*

