

Nebojša JanićijevićUniversity of Belgrade
Faculty of Economics – Department of
Business Economics and Management**Miloš Milovanović**Union University – Nikola Tesla
Faculty of Construction Management

THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON DECENTRALIZATION: THE ROLE OF ORGANIZATIONAL CULTURE*

Uticaj informaciono-komunikacione tehnologije na decentralizaciju – uloga organizacione kulture

Abstract

The paper explores the impact of organizational culture on the effects that the implementation of information and communication technology has on decentralization of organization. The starting assumption is that the implementation of information and communication technology does not have a predetermined and unique impact on centralization or decentralization of organization, but this impact rather depends on the context in which the implementation is performed. Organizational culture has a considerable influence on thinking and behavior of employees and managers since it shapes their interpretive schemes through assumptions, values, and norms that it contains. Therefore, organizational culture must be considered as one of the possible elements of the context on which the impact of information and communication technology (ICT) on structure decentralization depends. Starting with Handy's classification of organizational culture types, hypotheses on different impacts that ICT might have on decentralization in each of the culture types are generated. The conclusion is the following: ICT implementation in people culture will lead to a high decentralization, ICT implementation in task culture will lead to a moderate decentralization, ICT implementation in power culture will lead to a moderate centralization, and ICT implementation in role culture will lead to a high centralization.

Key words: *organizational structure, information and communication technology, organizational culture, decentralization*

Sažetak

U radu se istražuje uticaj organizacione kulture na efekte koje primena informaciono-komunikacione tehnologije ima na decentralizaciju organizacije. Polazi se od pretpostavke da primena informaciono-komunikacione tehnologije nema unapred određen i jedinstven uticaj na centralizaciju ili decentralizaciju organizacije, već da taj uticaj zavisi od konteksta u kome se primena vrši. Organizaciona kultura snažno utiče na mišljenje i ponašanje zaposlenih i menadžera budući da pretpostavkama, vrednostima i normama koje sadrži oblikuje njihove interpretativne šeme. Stoga se organizaciona kultura mora uzeti u razmatranje kao jedan od mogućih elemenata konteksta od koga zavisi uticaj informaciono-komunikacione tehnologije na decentralizaciju strukture. Polazeći od Hendijeve klasifikacije tipova organizacionih kultura, generišu se hipoteze o različitom uticaju koji IKT ima na decentralizaciju u svakom od njih. Zaključak je da će primena IKT u kulturi podrške voditi ka visokoj decentralizaciji, u kulturi zadatka ka umerenoj decentralizaciji, u kulturi moći ka umerenoj centralizaciji i u kulturi uloga ka visokoj centralizaciji.

Ključne reči: *organizaciona struktura, informaciono-komunikaciona tehnologija, organizaciona kultura, decentralizacija*

* The work is a part of the research project MNTR "The Implementation of Contemporary Management and Marketing Methods in Improving Competitiveness of Companies in Serbia in the Process of its Integration in the European Union." The earlier version of the paper has been presented at the conference YUINFO 2015.

Introduction

Without a doubt, information and communication technology (ICT) impacts on different aspects of modern organizations. There are numerous, both theoretical and empirical, confirmations that support this claim [3], [8], [34]. It has been proven that ICT leads to information processing cost reduction, decision-making quality improvement, decrease in the number of hierarchical levels and organization “thinning”, and also to decrease in middle-level management. But, what is particularly interesting is the impact that ICT has on delegation of authority and its consequence – the degree of centralization or decentralization of organizational structure. This impact has been the focus of the attention of academic and expert community [5]. The reason surely lies in a controversial nature of the relationship between ICT and this dimension of organization. While some authors find that ICT leads to a higher decentralization, others argue that that ICT in fact leads to a higher centralization of structure [21].

The degree of organizational structure decentralization is a consequence of delegation of authority as one of the subprocesses in organizational structure designing. Each organization must in some way delegate the decision-making authority vertically (through hierarchical levels), as well as horizontally (between managers and experts) [26]. In other words, an organization must determine who makes a particular decision. The consequence of authority delegation is a certain level of (de)centralization of structure. Organizational structure can be either centralized or decentralized. In the case when it is centralized, all or most of the decisions are made at the organization’s top by the leader or a small number of top managers; in the case when it is decentralized, the decision-making authority is more evenly dispersed across hierarchical levels so some decisions are made by managers at lower hierarchical level as well. Also, in a decentralized structure, the authority to make some complex or creative decisions is delegated to experts, that is, to non-managers.

Decentralized structure has its advantages and disadvantages [26]. The advantages of authority delegation, that is, decentralization are the following: 1. It frees managers from routine, operative tasks and makes space

for strategic, developmental or creative activities; 2. It improves the quality of decision-making since it is closer to the real problem and because a specialized manager who noticed the problem in the first place actually makes decisions; 3. It speeds up decision-making because it is not necessary to transfer information to higher hierarchical levels, nor to transfer the decisions made at those hierarchical levels back to the operative sphere where they are actually realized, whereby communication chain is shortened and the number of participants in decision-making is decreased; 4. It improves working morale and motivation and develops the competencies of middle and lower level managers who are in this way better prepared for career advancement.

Besides the obvious advantages, delegation of authority has some disadvantages as well. The first and major concern is the problem of controlling delegated decisions. Namely, when all the decisions are made by one or several managers at the organization’s top, it is relatively easy to control the effects of those decisions. When the right to make decisions is widely distributed, top management can easily lose control over the events in the organization, which could have unimaginable consequences. Also, the problem of control is always accompanied by the problem of coordination. When a larger number of decision-makers are present in the structure, the problem is how to coordinate them so that their decisions are not mutually contradictory.

Since decentralization has both advantages and disadvantages, choosing the right level of structure decentralization in the process of structure designing is always followed by a trade-off. There is no ideal level of decentralization – it all depends on the situation which a company is facing. The degree in which structure will be centralized or decentralized depends on many factors. According to the contingency theory of organization, the degree of (de)centralization depends on the size and age of organization [16], type of technology [35], environment [28], or strategy [7]. ICT holds a special place among these factors.

ICT implementation in an organization strongly impacts on the degree of its centralization or decentralization. The reason for this is the fact that the whole point of authority

delegation process is actually to locate accountability for decision-making. Decision-making is, in its nature, the process of information processing. Since ICT to the largest extent affects precisely the information processing in an organization, it is therefore clear that authority delegation as well as its consequence – decentralization – will be under the impact of ICT. However, in what way and in which direction does ICT impact on decentralization is a very controversial question. In that respect, there are three different schools of thought.

According to one school of thought, information technology leads to decentralization of decision-making in companies [21], [22]. The argument supporting this claim is based on the fact that ICT eliminates at least two barriers to decision-making decentralization in organizations. First, ICT enables all hierarchical levels, even the lowest ones, to have enough quality and updated information to make the right decisions. Namely, one of the crucial barriers to delegation of decision-making authority to lower hierarchical levels is the fact that executives and managers at lower levels of organization do not have enough information, and even not enough knowledge, that would enable them to make quality decisions. A specific problem is also that employees and managers at lower organization levels do not see the big picture, that is, they lack the information significant for an organization as a whole. This is the reason why delegation of authority to those levels could carry a high risk of making decisions at those levels that would have a parochial character and would optimize the goals of the particular unit where decisions were made, but would actually do harm to the organization as a whole. Simply stated, it is necessary to create a balance of authority and information: decision-making authority should be located at the level and the position that have enough information to make a quality decision. ICT enables that the necessary level of information exists at most hierarchical levels and most organizational positions, which would guarantee quality decision-making. Another barrier to decentralization which ICT eliminates and, therefore, favors in an organization, is the possibility of effective managerial control. Namely, in order for top management to delegate decision-making authority to lower levels, it must previously or simultaneously keep

control over delegated decisions and their effects. If top management does not have a mechanism for controlling the decisions delegated to lower levels, it will not be willing to delegate decision-making authority and hence the consequence would be a high centralization of decision-making. This inadequate competence of the organization's leader to create the mechanism of control is precisely the main reason for centralization of young and growing companies [16]. ICT enables faster, more effective, and cheaper information processing, and thereby also a more effective control by top management over decisions and processes happening at lower organizational levels. By enabling more effective control over delegated decisions, ICT eliminates the barrier to decentralization of decision-making.

The second school of opinion about the impact of ICT on decentralization argues in favor of the claim that ICT in fact leads to centralization [21]. Actually, this argument is based on the idea that ICT incites centralization because it eliminates some barriers which disable centralized decision-making. The key barrier to decision-making centralization is a limited ability of top management to gather and process information. Namely, in order to centralize decision-making, which means to make all or most of the decisions in an organization, top management must have all the information necessary for making the decisions. Since the number of decisions to be made in organizations, especially in large ones, can be substantial, it may easily happen that top management simply does not have the capacity to process all the necessary information. This is the reason why top management must delegate decision-making authority, especially for operative decisions, to lower levels of organization, which leads to decentralization. Gathering and processing the information from the operative sphere, which is very distant from top management, represent a problem *per se*. In most cases, it is very useful to delegate such decisions to lower-level management, simply because the gathering of the information for making those decisions, transferring of the information to the organization's top and processing of the said information would be accompanied by such distortions, delays, and costs that it would by no means be economic. However, ICT enables quick gathering, transferring and

processing of all the information, even the information from the operative sphere, by the organization's top. Thus, ICT actually leads to disappearance of middle management and decrease in the number of hierarchical levels. Since middle management mostly serves to transfer information from the bottom up and orders from the top to bottom in an organization, once ICT enables direct, effective, and quick information flow between the organization's operative sphere and the strategic organization's top, middle management will become redundant. This means that ICT eliminates barriers to decision-making centralization and, thereby, also leads to increased degree of centralization in modern organizations.

Besides these two contradictory points of view on ICT impact on decentralization, a third opinion also exists [21], [22]. According to this opinion, ICT has the capacity to increase both centralization and decentralization of organization. How will ICT impact on (de)centralization of structure in each individual organization depends on some other factors, such as information technology type used in a company, size and age of the company, degree of uncertainty in the company's environment, degree of repetitiveness of tasks in the structure, etc. These factors create a particular context in which ICT is implemented, so what effects ICT will have on (de)centralization of organizational structure depends precisely on the said context. One of the important components of every organization's context is the organization's culture. As a system of assumptions, values, and norms shared by employees and managers, organizational culture affects all decisions, actions, and interactions in a company [27]. This is why organizational culture should be explored as a possible factor determining in which direction ICT will impact on the degree of organization's (de)centralization.

The aim of this paper is to explore the way in which organizational culture influences ICT impact on decentralization of organization. The paper is explorative in character, and its purpose is to generate hypotheses on the culture as a factor which determines the character of the relation between ICT and authority delegation. This will be done by setting assumptions, based on characteristics of individual organizational culture types, about different effects of ICT on (de)centralization.

The paper is structured as follows: after defining organizational culture and its content, one of the widely accepted classifications of organizational culture types will be presented. Next, the character and effects of ICT impact on (de)centralization of organization in the context of four types of organizational culture will be analyzed. This will result in the hypotheses that formulate the assumptions about the direction of ICT impact in different types of organizational cultures.

Organizational culture: Concept, content and types

Organizational culture can be defined as *"a system of assumptions, values, norms and attitudes manifested through symbols which the members of organization have developed and adopted through mutual experience and which help them determine the meaning of the world around them and how to behave in it"* [27, p. 26]. As it can be noticed in the definition, organizational culture has a cognitive and a symbolic component in its content [31]. Cognitive component consists of mutual assumptions, values, and norms which the members of organization share and which shape their mental (interpretive) schemes. Thereby organizational culture determines the way in which the members of organization perceive and interpret the world around them but also how they behave in it. Cognitive content of organizational culture enables the members of organization to assign meanings to phenomena inside and outside of the organization in a unique way and also to uniquely react to the said phenomena. Symbols are visible part of organizational culture and they manifest its cognitive component. Semantic, behavioral and material symbols strengthen and convey, but also change the organizational culture [9].

Understanding of the concept of organizational culture implies noticing some of its important and distinctive characteristics [1], [25]. First, organizational culture is a social phenomenon since it occurs through social interactions and reveals itself only at the level of a social group. Second, creation of organizational culture takes a lot of time, because it emerges through accumulating the experience of people in organizations. Therefore, culture

changes slowly and with difficulty and the fact that a part of its content is subconscious in character also contributes to that. Third, culture gives uniqueness to an organization. It emerges as a combination of unique experiences of the members of organization due to which an organization differs from any other organization in its environment. Fourth, organizational culture provides a sense of certainty, order and safety to the members of an organization, because it gives purpose to phenomena and occurrences in the organization and around it by its own meaning.

Cultural assumptions as hypotheses on reality [31], values as ideal states which organization should strive to [30], and cultural norms as social expectations of their own kind with respect to behavior of the organization members [4], [20], represent strong guidelines for the members of organization with respect to understanding and treating of the people, phenomena, and occurrences in the organization. Everyday decisions that employees and managers make, actions they take, as well as interactions in which they engage, are all largely determined by the assumptions, values, and norms of organizational culture. The reason for this is by all means the fact that assumptions, values, norms, and attitudes shared by the members of organization significantly shape their interpretive schemes. Through interpretive schemes, the members of organization assign meanings to things and occurrences in the organization and outside of it, and in this way understand the reality that surrounds them [33], [12]. The behavior and also actions and interactions of the members of organization emerge from the meanings that the reality of organization has for them [1], [25]. Actually, organizational culture represents a form of collective interpretive scheme of the members of organization due to which they in a similar way assign meanings to phenomena, people, and occurrences inside and outside of the organization and also similarly deal with them [31]. In this way, a strong culture of an organization implies that all members of the organization in a similar way understand the organization, as well as a suitable way of its structuring, functioning, managing, and changing.

By impacting on decisions, actions, and interactions between managers and employees, organizational culture also impacts on many other important elements

of management and organization. Extensive empirical research has documented that organizational culture affects strategy [23], [38], performance control [13], organizational structure [29], compensation systems [37], performance appraisal [18], organizational learning [14], leadership [15], and organizational performance [36]. Organizational culture also influences job satisfaction, which is an aspect of organizational behavior [24], [32].

As we have already concluded, dispersion and implementation of ICT in an organization will have different effects on delegation of authority, depending on the context in which it is conducted. Organizational culture is an important component of organizational context since it shapes everyday actions and decisions of the organization's managers and employees through its assumptions, values, and norms. Therefore, it is clear that in different organizational cultures, the impact of ICT on decentralization will be different. Different types of organizational cultures, through their specific assumptions, values, and norms, create a specific context in which ICT is implemented and in which this implementation implies specific degree of (de)centralization. In order to be able to identify the role of organizational culture in determining the impact of ICT on decentralization, we must analyze the content and characteristics of different organizational culture types. In order to do this, however, it is necessary to first classify types of organizational cultures.

There are numerous classifications of organizational cultures in the literature [4], [6], [11], [17]. All these classifications differ from one another in terms of the criteria based on which organizational culture types are differentiated. In this paper, we will use *Handy's* classification, since it is based on the criteria that have implications for the relation between ICT and decentralization.

In *Handy's* classification [17], organizational cultures differentiate according to two criteria. The first criterion according to which organizational culture types are differentiated in *Handy's* classification is the assumption about distribution of power in organization. Distribution of power among members of a social group, such as an organization, is always set as one of the key questions that each social group must answer, and this goes for organizations as well. The solution of this issue is built

into the culture of the said group in the form of cultural assumptions [19]. According to power distribution criterion, we make distinction between organizational cultures that contain assumption about the need for authoritarian (that is, uneven or hierarchical) distribution of power and organizational cultures that contain assumption about the need for egalitarian, democratic (that is, even) distribution of power. Authoritarian, or hierarchical, organizational cultures contain the assumption that uneven distribution of power in a social system is inevitable, useful, and necessary for achieving its goals and purpose. In contrast, egalitarian cultures contain the assumption that in social systems, such as organizations, it is useful, possible, and necessary to have as even power distribution as possible and that only such power distribution enables achieving of the goals of social systems.

The second criterion according to which organizational culture types are differentiated is the primary framework of collective action, through which an organization achieves its goals. Each organization emerges in order to accomplish goals of its members or stakeholders by means of taking collective, coordinate actions. On the other hand, the nature of organizations is dichotomous: it contains work component (tasks and structures) and social component (people and their relations). This is why an organization must decide whether it will satisfy the goals and interests of its stakeholders and members primarily through social structure or through work structure. According to the criterion of suitable framework of collective action in organizations, we differentiate organizational cultures that contain the assumption that collective action should be taken within the framework of work structure and organizational cultures that contain the assumption that collective actions should be taken within the framework of social structure. The former organizational culture type implies task orientation, while the latter organizational culture type implies people orientation.

By using both criteria simultaneously, a matrix with four organizational culture types can be constructed (see Figure 1).

Power culture and role culture contain assumptions, values and norms of uneven, or hierarchical, distribution of power in organizations. On the other hand, people culture

Figure 1: Handy's classification of organizational culture types

		Social or people orientation	
Authoritarian or hierarchical distribution of power		Power culture	People culture
		Role culture	Task culture
		Work or task orientation	
		Egalitarian distribution of power	

Source: [17]

and task culture contain assumptions, values and norms of egalitarian distribution of power in organizations. Power culture and people culture have a common characteristic that they are primarily oriented to people, that is, to social component of organization. On the other hand, task culture and role culture contain the assumption that the primary component of organization is work, that is, tasks.

Power culture combines people orientation and orientation to uneven distribution of power in organization. The main characteristic of power culture is its orientation to the leader. Power culture is based on the assumption that organization is a means for achieving goals in the hands of its owner or leader. Power culture observes organization as a family: the almighty father of the family (*paterfamilias*) who knows everything and looks after all its members is at the head of organization, and in return the members obey him with no questions asked. The source of the leader's power in this culture is the control over resources (money, information) and/or charisma. In this culture, everything is based on the leader's personal supervision, so effectiveness of the organization's functioning largely depends on the leader's competence. The leader personalizes work in the organization to a large extent, so everything in it receives the leader's personal touch and depends on his/her style and competencies. Organizational structure is highly underdeveloped and informal and it often changes. In power culture, communication is very intensive and informal. Political processes and the battle of power are highly evident because the members of organization compete with each other to get closer to the leader, to attract his/her attention and, based on all of that, to gain better position in the organization. The main

advantage of power culture is the speed of its reaction. Since everything in this type of culture depends on the leader, then once he/she makes the decision about changes, this decision is put into action in a fast and effective way. Organizations with power culture, especially if they are also small, are among the most flexible organizations. The main disadvantage of power culture is that it is very risky – practically everything depends on just one person and his/her competencies. The problem with power culture is that it favors obedience to the leader and not competencies of people. In time, people with high competencies who do not agree with complete centralization of power at the organization's top will leave this culture, while mediocrities who do not mind that someone else makes decisions and takes risks and who obediently follow orders will stay. Power culture is suitable for relatively small and young organizations, in which highly educated people are not predominant, that do business in turbulent industries that require fast reactions.

Role culture is a truly bureaucratic culture. Formal rules and procedures are dominant in this type of culture, and everyone, including the leader and other managers, is expected to strictly follow rules and procedures. What the leader and his/her personality represent in power culture applies to formal rules and standards in role culture. There is a strong tendency to standardize and formalize each process, every behavior, and all the relations in the organization. In role culture, everything is based on logic, sense and rationality. Role culture is based on observing organization as an ordered social structure, regulated by preset rules and procedures. The metaphor for an organization with this type of culture is a machine. Contrary to power culture, which is always colored by the leader's personality, role culture is depersonalized. The very name of this type of culture suggests that the main elements of organization are impersonally assigned roles, rather than individuals as personalities. In this type of culture, power is gained based on hierarchical position and partly also based on expert knowledge. Role culture is most often found in large bureaucratized companies and other organizations (especially in public services). It can even be said that role culture implies a bureaucratic organizational structure.

Task culture is such a system of values and norms of behavior in which success and accomplishment are put on the highest pedestal. This is the reason why many call this culture a culture of accomplishment. Task culture is based on the assumption that organizations exist to complete tasks. Everything is oriented to work that needs to be done and everything is subordinated to it. People are not valued according to their position in the hierarchy, but according to their capability to contribute to performing of tasks. Power is derived from competence. Task culture is most suitable for people who are motivated by accomplishments, that is, by the work *per se*, rather than by material rewards. In task culture, values such as independence of individuals, flexibility, and adaptability predominate. This type of culture is most suitable for relatively small, specialized organizations with highly educated employees and sophisticated technologies, such as consulting agencies, law offices, advertising agencies, research agencies, and the like. Task culture most often implies team or project organizational structure. Its main advantages emerge from its orientation to success and results, flexibility, initiative, creativity, and entrepreneurship. The main disadvantage of this type of culture is its excessive dependence on people and their qualities.

People culture is the type of culture that is very rarely seen in companies. Its original name itself implies that people culture exists for the people in it. Its basic purpose is, according to the assumption of its members, to enable them to achieve their individual goals and interests. The focus is on an individual and his/her interests, while the goals of organization as a whole are neglected. This is also the reason why it is difficult to assume that a company would be able to survive with such a culture. The power in people culture is very widely distributed, so comparing to all other aforementioned types of culture, people culture is democratic to the largest extent. Individual freedom is highly valued and a fierce resistance is put up against any attempt to jeopardize this personal freedom through organizational rules. This is why organizations with this type of culture face the problem of loyalty of its members, who are more often loyal to themselves and their profession than to their organization. This type of culture can be most often found in universities, hospitals, institutes, and research facilities.

Organizational culture as a factor that shapes ICT impact on decentralization

The criteria according to which organizational cultures differ from one another, that is, the assumptions about desirable distribution of power and primary component of organization, have significant impact on the relation between ICT and decentralization of organization. The assumption about desirable distribution of power has quite clear implications for ICT impact on decentralization of organization. When ICT is implemented in an organization with predominant assumption about hierarchical or authoritative distribution of power as desirable distribution of power in the organization, it is quite clear that it will lead to centralization of decision-making. ICT is, as any other technology, just a means of achieving certain goals. Organizational structure is, on the other hand, also a tool for achieving the company's goals. A company will always have an organizational structure which, in the opinion of its top management, best contributes to achievement of the company's goals. The top management's opinion on what organizational structure is the best for the company largely depends on the assumptions and values of organizational culture. When the assumption of hierarchical, that is, uneven, distribution of power predominates in an organization, then managers and employees think that the best thing for the organization is to have a small group of people at its top who decide, while the others should respect and execute those decisions. In such a context, ICT will be used to achieve centralization of decision-making as a suitable model of organization's functioning. As already mentioned, ICT has the potential to increase both centralization and decentralization. When ICT is implemented in organizations with authoritative culture, it will be used by the leader and his/her associates to enable centralization of decision-making at the organization's top and to make it more effective. In the context of authoritative, hierarchical culture, a potential of ICT to eliminate barriers to centralization will be activated. On the other hand, when ICT is implemented in organizations in which the assumption that it is desirable to evenly distribute power in organization prevails, then ICT will lead to decentralization of decision-making. Since the assumption that it is good to

have the power of decision-making distributed as evenly as possible across all hierarchical levels in an organization prevails in egalitarian types of organizational cultures, it is only natural that in such cultures ICT will be used to increase decentralization of decision-making. Since ICT has the capacity to increase decentralization in organization, this will probably occur if the egalitarian cultural assumptions about power distribution are predominant in an organization. Following the above-stated, we can make the assumptions that implementation of ICT in power culture and role culture will lead to centralization of organizational structure, whereas implementation of ICT in people culture and task culture will lead to decentralization of organizational structure. Based on all said above, we may set two hypotheses:

H₁: Implementation of ICT in organizations dominated by power culture and role culture will lead to centralization of decision-making.

H₂: Implementation of ICT in organizations dominated by task culture and people culture will lead to decentralization of decision-making.

Assumptions, values and norms of the primary component of organization also impact on the effects of ICT implementation in an organization on (de) centralization of its structure. However, this impact is less direct, visible, and strong than the impact of the assumption of power distribution in the organization. If organization, due to organizational culture, perceives that a collective action is most effectively conducted through social structure, then people, their competences, motivation, values, and interactions will be of primary importance for the achievement of organization's goals. In such context, ICT is used above all for empowerment of people. Since in such a culture it is considered that everything depends on people, and not on formal roles or structure, ICT is used primarily as a tool for increasing the people's capacity to perform tasks. The ability of ICT to increase the speed and capacity and decrease the cost of information transferring will be used for development of people in the organization, regardless of their hierarchical position. Thus, ICT implementation in the context of culture preferring social component of organization will be the stimulus for decentralization.

If organization, due to organizational culture, perceives that a collective action is most effectively conducted through work structure or task structure, then formally defined roles, positions, organizational units, and hierarchical levels, and not the people and their relations, will be of primary importance in achieving organization's goals. When organizational goals are achieved through a system of formally defined roles, then ICT is used to provide the information and knowledge necessary for realization of these roles, as well as for controlling the realization of these roles by top management. In this case, ICT enables top management to more simply, more quickly and with higher quality provide the information necessary for performing tasks, and also for controlling the accomplishment of these tasks. In this way, ICT actually makes the process of decision-making centralization in the structure easier.

Based on all stated above, we can set the following two hypotheses:

H₃: Implementation of ICT in organizations dominated by power culture and people culture will lead to decentralization of decision-making.

H₄: Implementation of ICT in organizations dominated by task culture and role culture will lead to centralization of decision-making.

If we summarize at this point the analysis of the organizational culture's impact on the effects of ICT on (de)centralization of organizational structure, several conclusions can be made. First, organizational culture impacts on the relation between ICT and decentralization through two important assumptions: the assumption about desirable power distribution and the assumption about the primary component of organization. Accordingly, four types of organizational culture in which these assumptions are combined also have different effects on ICT impact on structure decentralization. Second, in role culture both assumptions create the context in which ICT is used for centralization of decision-making. Third, in people culture both assumptions create the context which leads to decentralization of decision-making. Fourth, in power culture the assumption about desirable distribution of power creates conditions for the ICT to provoke centralization, but the assumption about social component as the primary

component of organization creates conditions for the ICT to provoke decentralization. But, since the impact of the assumption about desirable distribution of power is stronger, we conclude that the ICT implementation in power culture will lead to moderate centralization. Fifth, in task culture the assumption about desirable distribution of power creates the context in which ICT leads to decentralization, but the assumption about work structure or task structure as the primary component of organization creates conditions for ICT to implicate centralization. Since the impact of the assumption about desirable distribution of power is stronger, we therefore conclude that that implementation of ICT in task culture will lead to moderate decentralization. Based on all said above, we may formulate a synthetic hypothesis:

H₅: Implementation of ICT in people culture will lead to a high decentralization; implementation of ICT in task culture will lead to a moderate decentralization; implementation of ICT in power culture will lead to a moderate centralization; and implementation of ICT in role culture will lead to a high centralization.

Conclusion

Information and communication technology (ICT) undoubtedly changes the appearance of modern organizations. It impacts on the changes of many important components of organization and management. Organizational structure is certainly one of them. Most researchers agree that organizational structure suffers changes when modern ICT is implemented in an organization. But, they disagree on the direction of these changes. One group of researchers holds the view that ICT implementation will lead, among other things, to structure decentralization, that is, to more even distribution of decision-making authority. By all means, there are arguments supporting this thesis. But, on the other hand, other group of researchers argues that ICT implementation in an organization can also lead to centralization, that is, to concentration of decision-making authority at the organization's top. A contemporary and very often encountered approach to management, called the contingency approach, brings a third perspective in explaining the relation between ICT and decentralization.

The contingency approach implies that relations between management components depend on the context in which these relations are set. Thus, in the case of ICT impact on decentralization it is assumed that this impact may lead to both centralization and decentralization of structure, depending on some third factors that constitute the context in which this impact is done. So far, numerous factors have been identified that may shape the context and modify the relation between ICT and decentralization. The aim of this paper is to suggest considering one more important element of organizational context that determines the nature of the relation between ICT and organizational structure – and that element is organizational culture.

Organizational culture as a set of assumptions, values, and norms shared by the members of organization significantly determines their opinions and behavior. Organizational culture imposes on the organization members the meanings of things and occurrences inside and outside of organization, whereby it directs the members to understand the world that surrounds them and act within in a specific way. Consequently, organizational culture represents an important element of the context in which processes within organization are conducted, which also applies to processes of structuring and ICT implementation. It is only natural that the nature of the impact that ICT implementation has on organization's decentralization depends on the organization's culture. If this is true, then it is also natural that the impact of ICT on decentralization will be different in different types of organizational cultures.

Based on *Handy's* classification of organizational culture types it can be assumed that organizational cultures which contain assumptions about the need for unequal or hierarchical distribution of power in the organization imply that ICT leads to centralization of decision-making, and that organizational cultures which contain the assumption about the need for equal of egalitarian distribution of power imply that ICT leads to decentralization of structure. On the other hand, organizational cultures that in their values favor social component or people imply that ICT implementation leads to decentralization of structure, while organizational cultures that favor work component or tasks will imply that ICT implementation leads to

centralization of structure. The conclusion is that ICT implementation in people culture will lead to a high decentralization; ICT implementation in task culture will lead to a moderate decentralization; ICT implementation in power culture will lead to a moderate centralization; and ICT implementation in role culture will lead to a high centralization.

References

1. Alvesson, M. (2002). *Understanding organizational culture*. London: Sage.
2. Ashkanasy, N., Wilderom, C., & Peterson, M. (Eds.). (2011). *Handbook of organizational culture & climate* (2nd ed.). Thousand Oaks: Sage.
3. Aubert, P., Caroli, E., & Roger, M. (2006). New technologies, workplace organization and the structure of the workforce: Firm-level evidence. *Economic Journal*, Royal Economic Society, *116*(509), 73-93.
4. Balthazard, P., Cooke, R. E., & Porter, R. (2006). Dysfunctional culture, dysfunctional organization: Capturing the behavioral norms that form organizational culture and drive performance. *Journal of Managerial Psychology*, *21*(8), 709-732.
5. Bloomfield, B., & Coombs, R. (1992). Information technology, control and power: The centralization and decentralization debate revisited. *Journal of Management Studies*, *29*(4), 459-484.
6. Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organizational culture: The competing values framework* (2nd ed.). San Francisco: Jossey-Bass.
7. Chandler, A. (1962). *Strategy and structure*. Cambridge, MA: The MIT Press.
8. Čudanov, M., Jaško, O., & Jeftić, M. (2009). Influence of information and communication technologies on decentralization of organizational structure. *ComSIS*, *6*(1), 93-109.
9. Dandridge, T., Mitroff, I., & Joyce, W. (1980). Organizational symbolism: A topic to expand organizational analysis. *Academy of Management Review*, *15*(1), 77-82.
10. Daron, A., Aghion, P., Lelarge, C., Van Reenen, J., & Zilibotti, F. (2006). Technology, information and the decentralization of the firm. *Quarterly Journal of Economics*, *122*(4), 1759-1799.
11. Deal, T., & Kennedy, A. (2011). *Corporate cultures: The rites and rituals of corporate life* (2nd ed.). New York: Perseus Books Publishing.
12. Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York: McGraw Hill.
13. Deem, J. M., Barnes, B., Segal, S., & Preziosi, R. (2010). The relationship of organizational culture to balanced scorecard effectiveness. *SAM Advanced Management Journal*, *75*(4), 31-39.
14. De Long, D. W., & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *Academy of Management Executive*, *14*(4), 113-127.
15. Giberson, T. R., Resick, C. J., Dickson, M. W., Mitchelson, J. K., Randall, K. R., & Clark, M. A. (2009). Leadership and organizational culture: Linking CEO characteristics to cultural values. *Journal of Business Psychology*, *24*(2), 123-137.

16. Greiner, L. E. (1998). Evolution and revolution as organizations grow. *Harvard Business Review*, 76(3), 55-63.
17. Handy, C. (1979). *Gods of management*. London: Pan.
18. Henri, J. F. (2006). Organizational culture and performance measurement systems. *Accounting, Organizations and Society*, 31(1), 77-103.
19. Hofstede, G. (2001). *Culture's consequences* (2nd ed.). Thousand Oaks, CA: Sage.
20. Hofstede, G., Neuijen, B., Ohayiv, D. D., & Sanders, G. (1990). Measuring organizational culture: A qualitative and quantitative study across twenty cases. *Administrative Science Quarterly*, 35(2), 286-316.
21. Hunter, S. (2010). Same technology, different outcome? Reinterpreting Barley's technology as an occasion for structuring. *European Journal of Information Systems*, 19(1), 689-703.
22. Hunter, S. (1999). Information technology and centralization: An empirical investigation. In R. Burton, & B. Obel (Eds.), *Workshop on Organizational Design*, Brussels: EIASM.
23. Klein, A. (2011). Corporate culture: Its value as a resource for competitive advantage. *Journal of Business Strategy*, 32(2), 21-28.
24. Lund, D. B. (2003). Organizational culture and job satisfaction. *Journal of Business & Industrial Marketing*, 18(3), 219-236.
25. Martin, J. (2002). *Organizational culture: Mapping the terrain*. London: Sage.
26. Mintzberg, H. (1979). *The structuring of organizations*. New Jersey: Prentice Hall.
27. Janićijević, N. (2013). *Organizaciona kultura i menadžment*. Beograd: Ekonomski fakultet.
28. Lawrence, D., & Lorsch, G. (1969). *Organization and environment*. Homewood: Richard D. Irwin.
29. Ranson, S., Hinings, B., & Greenwood, R. (1980). The structuring of organizational structures. *Administrative Science Quarterly*, 25(1), 1-17.
30. Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
31. Schein, E. (2004). *Organizational culture and leadership*. San Francisco: Jossey-Bass.
32. Silverthorne, C. (2004). The impact of organizational culture and person-organization fit on organizational commitment and job satisfaction in Taiwan. *Leadership & Organization Development Journal*, 25(7), 592-599.
33. Smircich, L. (1983). Organizations as shared meanings. In L. Pondy, P. Frost, G. Morgan, & T. Dandridge (Eds.), *Organizational symbolism* (pp. 55-65). Greenwich, CT: JAI.
34. Ziadi, J., & Kuofie, M. (2006). Impact of ICT on organizations in Tunisia. *The Electronic Journal on Information Systems in Developing Countries*, 28(4), 1-8.
35. Woodward, J. (1965). *Industrial organization: Theory and practice*. London: Oxford University Press.
36. Wilderom C., Glunk, U., & Maslowski, R. (2000). Organizational culture as a predictor of organizational performance. In N. M. Ashkanasy, C. P. M. Wilderom & M. F. Peterson (Eds.), *The handbook of organizational culture and climate* (pp. 193-211). Thousand Oaks: Sage.
37. Wright, A. (2010). Culture and compensation: Unpicking the intricate relationship between reward and organizational culture. *Thunderbird International Business Review*, 52(3), 189-202.
38. Yarbrough, L., Morgan, N. A., & Vorhies, D. W. (2011). The impact of product market strategy-organizational culture fit on business performance. *Journal of the Academy of Marketing Science*, 39(4), 555-573.



Nebojša Janićijević

is a Full Professor at the Faculty of Economics, University of Belgrade, where he teaches courses in the field of organization, human resources management and change management to students at undergraduate, graduate and doctoral studies. So far, as an author and coauthor he published several books, and among them "*Organizaciona kultura i menadžment*" (Organizational Culture and Management), "*Upravljanje organizacionim promenama*" (Organizational Change Management) and "*Organizacija preduzeća*" (Enterprise Organization). He published a number of articles in foreign and domestic academic journals and participated in many international scientific conferences. He was three times at study stays at U.S. universities as a receiver of fellowship of Fulbright Program. He is a member of the European Group for Organizational Studies (EGOS) and the European Academy of Management (EURAM). Nebojša Janićijević is a consultant for leading domestic companies in the areas of organizational restructuring and human resources management.



Miloš Milovanović

is a Teaching Assistant at Union University – Nikola Tesla in Belgrade, where he teaches courses in urban planning, presentation techniques, modern architecture, architecture critics, and project planning at undergraduate studies at the Faculty of Construction Management. He is the coauthor of "*Priručnik za organizovanje letnje škole arhitekture*" (Manual for Organizing Summer School of Architecture) and the article in *Architectural Approach*. He participated in several exhibitions in Belgrade, Zagreb, and Sarajevo, and the latest exhibition he participated in was the 37th Annual Salon of Architecture in Belgrade. He was the winner of the "Project portfolio 33" competition and a participant at the conference "On Architecture" with the project "Alchemist – Sustainable Development of Bor".