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JEL: O34,L22,L25,C12,C39
DOI:10.5937/industrija46-19478
UDC: 005.336.4
005.336.1
Original Scientific Paper

Intellectual Capital and Organizational Effectiveness: PLS-SEM approach

Article history:
Received: 9 October 2018
Sent for revision: 16 October 2018
Received in revised form: 15 November 2018
Accepted: 15 November 2018
Available online: 28 December 2018

***Abstract**: An intellectual capital or intangible assets, as valuable economic resources, is increasingly becoming key driver of organizations' economic performance and competitiveness. The purpose of this research is to examine the three dimensions of intellectual capital i.e. human capital, structural capital, and relational capital, and their interdependence and, to test their direct and total effects on organizational effectiveness according to competing values approach. The proposed research model is tested in product-oriented and service-oriented organizations in the Republic of Srpska, Bosnia and Herzegovina, to establish similarities and differences within these two types of organizations. The research was performed using psychometrically validated questionnaires to measure intellectual capital and organizational effectiveness. To test hypothesized correlations partial least squares structural equation modelling (PLS-SEM) is employed. The main findings from this research are: interdependence of intellectual capital dimensions and their direct effects on certain organizational effectiveness models are significant in both types of organizations but in service-oriented organizations there is insignificant effect of human capital on structural capital, and, finally, total effects analysis shows that positive inter-dependence of intellectual capital dimensions increases the total positive effect of intellectual capital on organizational effectiveness. The final defined structural models show a robust explanation of the organizational effectiveness variance in observed context.*

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Keywords: *Intellectual capital, Human capital, Structural capital, Relational capital, Organizational Effectiveness, Competing Values Approach, Partial Least Squares Structural Equation Modelling.*

Intelektualni kapital i organizaciona efektivnost: PLS-SEM pristup

Apstrakt*: Intelektualni kapital ili neopipljiva imovina, kao oblik vrijednog ekonomskog resursa, sve više postaje ključni pokretač ekonomskih performansi i konkuretnosti organizacija. Svrha ovog rada je da istraži tri dimenzije intelektualnog kapitala kao što su ljudski kapital, strukturni kapital i relacioni kapital, i njihovu međuzavisnost i da ispita njihove direktne i ukupne efekte na organizacionu efektivnost posmatranu prema pristupu konkurentskih vrijednosti. Predloženi istraživački model se ispituje u slučaju proizvodnih i uslužnih organizacija u Republici Srpskoj, Bosni i Hercegovini, kako bi se ustanovile sličnosti i razlike između ove dvije vrste organizacija. Istraživanje je vršeno primjenom psihometrijski validiranih upitnika a radi mjerenja intelektualnog kapitala i organizacione efektivnosti. Kako bi se testirali pretpostavljeni odnosi korišćeno je modeliranje strukturnih jednačina metodom parcijalnih najmanjih kvadrata (PLS-SEM). Osnovni rezultati istraživanja podrazumjievaju da su: međusobni uticaji dimenzija intelektualnog kapitala i njihovi direktni uticaji na određene modele organizacione efektivnosti značajni za obje vrste organizacija dok kod uslužnih organizacija postoji beznačajan uticaj ljudskog kapitala na strukturni kapital, i, u konačnici, analiza ukupnih uticaja pokazuje da pozitivna međuzavisnost dimenzija intelektualnog kapitala povećava ukupni uticaj intelektualnog kapitala na organizacionu efektivnost. Krajnji definisani strukturni modeli daju robusno objašnjenje varijacije organizacione efektivnosti u posmatranom kontekstu.*

Ključne reči*: intelektualni kapital, ljudski kapital, strukturni kapital, relacioni kapital, organizaciona efektivnost, pristup konkurentskih vrijednosti, modeliranje strukturnih jednačina metodom parcijalnih najmanjih kvadrata.*

1. Introduction

In present business environment, companies are faced with the need to change their business strategies and policies to respond to sociological and demographic changes, such as globalization, increasing competition, technological advancements and accelerated aging of the population. The traditional organizational management is no longer the most suitable, and organizations are forced to find new ways of achieving market

competitiveness, through investments in employee training, customer relationships development, research and development and information systems. In this way, resources based on knowledge and immaterial organizational assets, known as intellectual capital, as a basis for competitiveness achievement, are gaining increasing importance compared to other types of capital, such as physical and financial capital. Intellectual capital is considered as key driver of organizational success in present knowledge economy. There are many studies that indicate the significance of intellectual capital in different countries and various industrial sectors (Chen et al., 2004; Phusavat et al., 2011; Pirozzi & Ferulano, 2016), and how important role intellectual capital-organizational performance relationship has (Halim, 2010; Cleary & Quinn, 2016; Ramadan et al., 2017).

Intellectual capital, which is most often seen as a construct of human, structural and relational capital (Bontis, 1999; Zerenler et al., 2008), contributes to the organization's ability to respond to changing consumers' needs and wishes and to turbulent market conditions. Organizational ability to react and adapt to changes in external environment represent key feature of an effective organization. Employees with their knowledge and skills play a central role in achieving organizational effectiveness. The organizational ability to externalize employees' knowledge through systems, procedures and databases, and to align knowledge and technologies with market requirements and environmental conditions, enables the effective functioning of the organization (Wang & Tunzelmann, 2000).

According to the author's knowledge, there are no research dedicated to examining the impact of intellectual capital and its dimensions on organizational effectiveness according to competing values approach. The competing values approach represents a comprehensive concept of value dimensions that should be evaluated for each organization (flexibility, control, internal focus, external focus, organizational means and ends).It contains four models of organizational effectiveness: human relations model, internal process model, open systems model, and rational goal model. There is very little research aimed to investigate intellectual capital and its significance in context of Republic of Srpska, Bosnia and Herzegovina.

The purpose of this research is to examine the inter-relationships of intellectual capital dimensions and to determine the existence of positive relationship between intellectual capital and organizational effectiveness according to competing values approach in product-oriented and service-oriented organizations in the Republic of Srpska, Bosnia and Herzegovina. Intellectual capital dimensions and organizational effectiveness models are defined and conceptualized based on literature review. This research seeks to examine the appropriate relationships between variables in the case of two

different types of organizations in order to determine the consistency of results in the Republic of Srpska, Bosnia and Herzegovina context.

Therefore, intellectual capital and organizational effectiveness relationship in product-oriented and service-oriented organizations is investigated, to establish certain similarities and differences in proposed relationship.

The results of the research have shown that there is a positive relationship between intellectual capital and organizational effectiveness, regardless of organizational type.

In the first part of the research, an overview of the previous intellectual capital, organizational effectiveness, and, finally, the intellectual capital and organizational performance relationship, is given. In the second part of the research, used research methodology was presented, followed by detail data analysis and discussion of obtained results. The conclusion summarizes the findings that have emerged and gives some guidelines for managers on intellectual capital management to improve organizational effectiveness, as well as suggestions for future research.

2. Literature review

2.1. Intellectual capital

The interdisciplinary intellectual capital concept (Bontis, 1999; Marr& Chatzkel, 2004, Morariu, 2014) present an object of interest for many researchers and practitioners over the past two decades. Over time, intellectual capital has been defined in various ways: as a difference between the accounting and market value of the company (Stewart& Stephanie, 1994), as "knowledge that can be converted into value" (Edvinsson& Malone, 1997), as the sum of all knowledge applied in business operations to achieve a competitive advantage (Youndt, et al., 2004), etc.. However, the most common definition of intellectual capital implies that it includes all knowledge and experience, professional knowledge and skills, connection with goals and technological abilities, and its application provides competitive advantage of the company. Thus, it can be concluded that intellectual capital consists of resources and abilities that are rare and valuable, can not be copied and have no substitutes, which ensures that organization can achieve superior performance and sustainable competitive advantage.

There are many classifications of intellectual capital,such as: human capital and structural capital (Edvinsson, Malone, 1997); human capital, organizational capital and social capital (Reed, Lubatkin, Srinivasun, 2006); structural capital, consumer capital, and employee capital (Zerenler et al.,

2008), etc... The most widely used classification of intellectual capital implies that it consists of human capital, structural capital and relational capital (Bontis, 1999; Zerenler et al., 2008, Cabrita & Bontis, 2008, Sriranga & Vijay, 2014).

Human capital is the key dimension of intellectual capital and valuable organizational assets. It is a basic property of the organization, because it is a source of renewal of business strategy, creativity, innovation, and, consequently, leads to greater competitive advantage (Edvinsson& Malone, 1997;Bontis, 1998;O'Sullivan& Schulte, 2007). Human capital implies the collective ability of employees to solve operational problems and consumer problems (Phusavat et al., 2011). Based on knowledge, talent and skills of employees that compose human capital (Ghosh& Mondal, 2009), human capital provide organizational uniqueness (O'Sullivan& Schulte, 2007), through creating added value to ensure loyalty of the stakeholders (Bontis et al., 2007; Cabrita& Bontis, 2008;Ghosh& Mondal, 2009). This type of capital has great importance for achieving the competitive advantage and above-average organizational performance.

Structural capital consists of organizational abilities, culture, processes, patents, trade marks, databases, etc. (Denicolai et al., 2015). It includes the knowledge that remains in the company after employees leave (St-Pierre& Audet, 2011).There is an interdependence between human capital and structural capital in the intellectual capital creation process (Cabrita& Bontis, 2008). Structural capital provides the necessary infrastructure for establishing external relations (Demartini, 2015) and supports the promotion of human capital (Bontis, 1998; Ilyin, 2014), which plays a key role in the creation and exploitation of the structural capital potential in creating organizational value and achieving economic performance (Bontis, 1998; St-Pierre& Audet, 2011).

Relational capital consists of knowledge that is contained in the identification, development and maintenance of external relationships (Bontis, 1999). Based on it, the company has access to the knowledge and resources contained and emerged from the network of relationships (Edvinsson& Malone, 1997; Bontis, 1998;Meles et al., 2016). It implies the organizational ability to create value based on complex relationships with the organization's stakeholders (Cabrita& Bontis, 2008;Meles et al., 2016).Relational capital improves relationships of human and structural capital with stakeholders and affects their perceptions of organizations (Cabrita& Bontis, 2008;Meles et al., 2016). It enables the development of databases with the necessary information on external stakeholders, which are used to forecast and define future business strategies of the organization.Relational capital is important for improving organizational performance, because it can contribute to creation of confidence in the organization. Therefore, relational capital should not be viewed as an isolated system, because the probability of success of the

organization decreases, regardless of the innovativeness and competitiveness of the product, if the organization fails to build alliances and appropriate relationships with its consumers and suppliers (Hormiga et al., 2011).Some elements of relational capital are alliances and partnerships, brand and brand value, community relations, reputation, loyalty and customer satisfaction, franchises, joint ventures, licenses, networking systems, relationships with suppliers, knowing distribution channels, (Bontis et al., 2000; Bollen et al., 2005).

Following hypotheses, based on previous research, are:

- Hypothesis 1: Human capital is positively associated with relational capital.
- Hypothesis 2: Human capital is positively associated with structural capital.
- Hypothesis 3: Relational capital is positively associated with structural capital.

2.2. Organizational effectiveness

Organization should be regarded as responsible for achieved performance to their stakeholders. Intangible assets and knowledge, such as know-how, skills and expertise, relationships with consumers, information, databases, organizational structure, etc., contribute to value creation, improvement of economic performance and competitive advantage achievement (Sullivan & Edvinsson, 1996; Youndt et al., 2004). Many studies have shown that intellectual capital affects organizational performance (Bontis, 1998; Bollen et al., 2005; Sharabati et al., 2010), thereby contributing to the creation of higher levels of efficiency and competitiveness. Some authors have found that intellectual capital affects the financial performance of the organization (Youndt et al., 2004;Clarke et al., 2011). Thus, intellectual capital influences the creation of value which, in turn, leads to superior performance in the present knowledge economy. A direct correlation between intellectual capital efficiency and organizational performance has been confirmed (Bollen et al., 2005). Organizational effectiveness has become a central topic in the field of business sustainability. Many authors emphasize the role of employees in achieving organizational effectivenessand their participation in problem solving and decision making that results in higher productivity and effectiveness. Organizational effectiveness is a multidimensional construct that determines several aspects of organizational effectiveness, in particular organizational processes and goal orientation, in accordance with the context of the company. Organizational effectiveness studies have shown that companies that have clearly defined goals achieve better performance and that the flexibility and empathy of managers towards employees is of utmost importance for the effectiveness of the organization facing internal and external pressures.Also, organizational effectiveness depends on the ability of

the organization to transform knowledge and technology in line with market demands (Wang, Tunzelmann, 2000), as well as the ability of the organization to cope with environmental challenges that, to a certain extent, decelerate the organizational learning processes (Chermack, Bodwell, Glick , 2010).

An attempt to establish a universal definition of the organizational effectiveness is characterized by numerous controversies arising from the fact that organizations face a variety of environmental constraints and have multiple objectives and different time periods for their fulfilment. From all this derives the necessity of creating a comprehensive approach to the organizational effectiveness to have better understanding and comprehensive discussion of this organizational phenomenon.However, in the current literature, there is no generally accepted view of what constitutes organizational effectiveness nor it is considered that some existing approach to effectivenessis morerelevant compared to others.

The competing values approach (Quinn & Rohrbaugh, 1983) views the organization as a dynamic and contradictory system managed by a manager, with the obligation to meet the organization's competitive goals. This approach defines four models of organizational effectiveness based on three value dimensions: internal-external focus, control-or-flexibility and the organizationalmeans and ends. By crossing the first two value dimensions, four different models of organizational effectiveness are defined: the human relations model, internal process model, rational goal model, and open systems model. Each organizational effectiveness models has appropriate goals and organizational processes. Each of them has its own value dimensions, some of which are mutually exclusive. The human relations model is characterized by internal focus and flexibility, and emphasizes commitment of employees and morale, cohesion and human resources. The internal process model is characterized by internal focus and control, and emphasizes stability and information management and communication. The open systems model is characterized by external focus and flexibility, and emphasizes timeliness, adaptability and resource utilization. The rational goal model is characterized by external focus and control, and emphasis achieving efficiency and productivity.The competing values approach to organizational effectiveness treats the effectiveness of an organization as a construct because of its paradoxical, conflicting and contradictory nature (Quinn, 1988). Although some of the organizational effectiveness models do not share a common value dimension, such as human relations model and rational goal model on the one hand, and internal process model andopen systems model on the other hand, many organizations can be flexible and controlled at the same time (Quinn, 1988). Organizations that emphasize morale and cohesion and value human resources can strive to achieve efficiency and productivity. Therefore, according to this approach, the possibility of simultaneous existence of opposite organizational effectiveness models in the same

organization is not impossible, although they can be perceived as mutually exclusive models due to the assumptions on which they rest.The recommendation of the founder of this approach is to strive to achieve a balance between the four organizational effectiveness models, regardless of the fact that they are based on conflicting and contradictory goals. The suggested value dimensions should be evaluated when assessing the effectiveness of each organization in order to determine the presence of each of the four organizational effectiveness models and to measure organizational effectiveness achieved by balancing value dimensions (Quinn & Rohrbaugh, 1983).

According to above-mentioned research, the following hypotheses are:

- Hypothesis 4: Human, structural and relational capital have direct positive effect on organizational effectiveness according to competing values approach.
- Hypothesis 5: The positive effect of human capital and relational capital on organizational effectiveness according to competing values approach is increased through structural capital mediation.

3. Research methodology

Questionnaire as instrument used to measure intellectual capital and its dimensions: human capital, structural capital and relational capital, contains 53 items, developed and validated by Nick Bontis, respected author in intellectual capital field (Bontis, 1998, 1999, 2000). Competing values instrument (CVI) is used to measure organizational effectiveness which is analysed through competing values approach to organizational effectiveness. This questionnaire contains 16 items and it is developed by group of authors with certain variations (Zammuto &Krakower, 1991; Shortell et. al., 1995;Kalliath et. al., 1999;Helfrich et. al., 2007). To measure intellectual capital and organizational effectiveness, seven-point Likert scale is used, where 1 indicates completely disagree and 7 indicates completely agree. In this research, perceptual measures are employed to evaluate intellectual capital and organizational effectiveness. According to results of previous researches, perceptual measures are widely used to measure intangible resources (Kannan & Aulbur, 2004). These measures show significant correlation with objective measures of organizational success (Hansen & Wernerfelt, 1989; Bontis et al., 2002). In this research, industry type is used as control variable to determine whether intellectual capital-organizational effectiveness relationship differs between product-oriented and service-oriented organizations.

Previously mentioned questionnaire with cover letter that describes aim of the research was mailed to 500 organizations in the Republic of Srpska, Bosnia and Herzegovina, with request to be fulfilled by executives as representatives

of each organization. The questionnaires were fulfilled and returned by 157 respondents (some of the questionnaires have incomplete or incorrect answers), while some executives have refused to participate in research. The final sample of 150 correctly filled questionnaires is used in further analysis. Observed sample contains 57 product-oriented and 93 service-oriented organizations.

To test proposed hypotheses partial least squares structural equation modelling technique is employed (PLS-SEM). To assess structural equation models SmartPLS 3.2.7 software is used. In literature, it is often indicated "10 times" as rule of thumb to determine necessary sample size to use PLS-SEM. This rule of thumb indicates that the sample size has to be at least 10 times greater than the largest number of formative indicators which measure latent construct or at least 10 times greater than the largest number of paths aimed at certain latent construct in structural model (Barclay et al., 1995). In proposed research model, only reflective measurement models are used, so the second condition has to be fulfilled to have representative sample size. Latent constructs in research model are: three dimensions of intellectual capital (human capital, structural capital and relational capital) and four organizational effectiveness models (human relations model, internal process model, open systems model and rational goal model). The most complex partial regression in PLS model has 3 predictors which are intellectual capital dimensions (3*10=30). So, in line with above-mentioned condition, 30 observations represent necessary sample size that is several times smaller than the real sample size of 150 organizations used in this research. In addition, the sample size is determined by research field in which structural modelling is applied and it is in line with data characteristics (Hair et al., 2011).

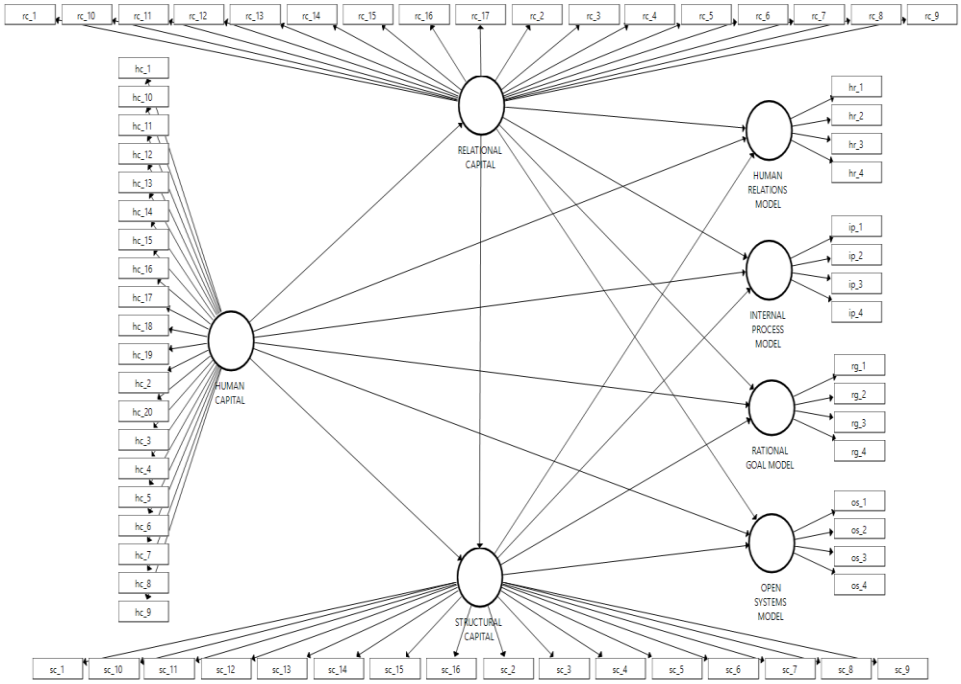
4. Research results

Power analysis for multiple regression models is performed because PLS-SEM is based on assumptions of OLS regression (Cohen, 1992). Results of power analysis obtained by G*Power 3.1.9.2, when there are maximum 3 endogenous constructs as predictors in measurement and structural model and at level of significance 5%, two-tailed test, 55 observations are needed to obtain 80% statistical power of the model to identify 25 % coefficient of determination of endogenous construct or 0.15 effect size. Kolmogorov-Smirnov's and Shapiro-Wilk's normality test is used for intellectual capital and organizational effectiveness items. However, normality assumption is not necessary condition to apply structural equation modelling. PLS-SEM is robust enough not to require normality of data's distributions (Barclay et al., 1995).

4.1. Model estimation

PLS algorithm (Lohmöller, 1989), the path weighting scheme, with maximum 300 iterations, stop criterion of $1*10^{-7}$ and equal indicator weights for the initialization is used to assess proposed conceptual research model (Fig. 1).

Figure 1 Proposed conceptual research model



Source: Author

In proposed research model, align with developed hypotheses and defined measurement indicators, all latent constructs are reflective, so it is necessary to evaluate the reflective measurement models before the assessment of structural models (inner models) is performed.

4.1.1. Assessment of the reflective measurement models

Assessment of the reflective measurement models includes examination of the indicator reliability, internal consistency reliability, convergent validity and discriminant validity. Latent constructs' indicators with loadings below 0.4 are removed from the measurement models. Cronbach's α (Churchill, 1979)and composite reliability indicator (ρ_c) (Jöreskog, 1971) have values between 0.7 and 0.95, in case of product-oriented and service-oriented organizations, which represent "satisfactory to good" reliability levels(Hair et al. 2017b) and internal consistency reliablity is established. Cronbach's α for intellectual capital constructs is between 0.896 and 0.927, in case of product-oriented organizations, and between 0.894 and 0.939 in case of service-oriented organizations, which is similar to results of other authors (Bontis, 1998; Bontis et al., 2000; Moslehi et al., 2006). Convergent validity indicates that average variance extracted (AVE) is above 0.5 for each latent construct and more than 50% indicator's variance is explained so convergent validity is established. Internal consistency and convergent validity for each latent construct in product-oriented and service-oriented organizations are shown in Table 1.

Discriminant validity is assessed by using HTMT (heterotrait-monotrait) criterion (Henseler et al., 2015). The more conservative HTMT threshold above 0.85 (Kline, 2011) and more liberal HTMT threshold above 0.9 (Gold et al., 2001) suggest the lack of discriminant validity problems. Latent constructs structural capital and open systems models in case of product-oriented organizations and relation capital and structural capital in case of service-oriented organizations have HTMT values above conservative HTMT criterion threshold of 0.85 but still below liberal HTMT criterion threshold of 0.9. Even though these constructs are conceptually differ, maybe it is difficult to empirically distinct them in research context so it is justified to use more liberal HTMT criterion. Next, bootstrapping procedure with 5.000 samples and no-sign changes option, BCa bootstrap confidence intervals and two-tailed testing at the 5 % significance level show that HTMT significantly differ from value 1 so discriminant validity is established for all latent constructs. HTMT values are shown in Table 2.

Table 1. Convergent validity and internal consistency reliability

Human capital		*Relational capital*		*Structural capital*		*Human relations model*		*Internal process model*		*Rational goal model*		*Open systems model*	
Product	*Service*	*Product*	*Service*	*Product*	*Service*	*Product*	*Service*	*Product*	*Service*	*Product*	*Service*	*Product*	*Service*
Cronbach's α													
0.927	0.939	0.896	0.894	0.919	0.899	0.909	0.925	0.875	0.898	0.799	0.831	0.898	0.869
Composite reliability (ρ_c)													
0.936	0.947	0.915	0.913	0.931	0.917	0.936	0.948	0.914	0.936	0.861	0.887	0.929	0.910
AVE													
0.514	0.514	0.520	0.517	0.513	0.505	0.787	0.819	0.730	0.831	0.617	0.663	0.767	0.717
Remaining items with loading values													
hc_1 0.654	hc_1 0.669	rc_1 0.798	rc_1 0.798	sc_1 0.508	sc_10 0.824	hr_1 0.815	hr_1 0.798	ip_1 0.890	ip_1 0.892	rg_1 0.898	rg_1 0.879	os_1 0.926	os_1 0.816
hc_10 0.739	hc_10 0.814	rc_10 0.780	rc_10 0.824	sc_10 0.802	sc_11 0.528	hr_2 0.935	hr_2 0.930	ip_2 0.923	ip_2 0.935	rg_2 0.497	rg_2 0.705	os_2 0.859	os_2 0.863
hc_11 0.622	hc_11 0.783	rc11 0.744	rc_11 0.692	sc_11 0.574	sc_12 0.745	hr_3 0.918	hr_3 0.941	ip_3 0.934	ip_3 0.907	rg_3 0.811	rg_3 0.840	os_3 0.802	os_3 0.853
hc_12 0.631	hc_12 0.711	rc_13 0.710	rc_12 0.743	sc_12 0.693	sc_13 0.699	hr_4 0.875	hr_4 0.944	ip_4 0.637		rg_4 0.870	rg_4 0.822	os_4 0.912	os_4 0.855
hc_14 0.791	hc_13 0.660	rc_14 0.590	rc_13 0.706	sc_13 0.571	sc_15 0.716								
hc_15 0.740	hc_14 0.710	rc_16 0.711	rc_14 0.710	sc_15 0.672	sc_16 0.740								
hc_18 0.761	hc_15 0.742	rc_2 0.759	rc_2 0.627	sc_2 0.706	sc_2 0.746								
hc_19 0.684	hc_17 0.670	rc_7 0.717	rc_6 0.543	sc_3 0.796	sc_3 0.687								
hc_20 0.767	hc_18 0.825	rc_8 0.773	rc_8 0.688	sc_4 0. 755	sc_7 0.745								
hc_5 0.688	hc_19 0.801	rc_9 0.595	rc_9 0.812	sc_6 0.744	sc_8 0.523								
hc_6 0.743	hc_20 0.671			sc_7 0.849	sc_9 0.796								
hc_7 0.602	hc_4 0.488			sc_8 0.766									
hc_8 0.798	hc_5 0.728			sc_9 0.787									
hc_9 0.781	hc_6 0.610												
	hc_7 0.685												
	hc_8 0.810												
	hc_9 0.732												

Source: Author

Table 2. Discriminant validity – HTMTvalues

	Human capital		Relational capital		Human relations model		Internal process model		Rational goal model		Open systems model	
	Product	Service	Product	Service	Product	Service	Product	Service	Product	Service	Product	Service
Relational capital	0.741	0.840			0.620	0.692	0.492	0.522	0.630	0.640	0.785	0.773
Structural capital	0.729	0.760	0.812	0.868	0.580	0.655	0.483	0.551	0.607	0.679	0.856	0.795
Human relations model	0.759	0.785					0.520	0.628				
Internal process model	0.492	0.477										
Rational goal model	0.527	0.438			0.546	0.450	0.609	0.641			0.659	0.715
Open systems model	0.771	0.691			0.741	0.809	0.547	0.660				

Source: Author

4.1.2. Assessment of the structural models

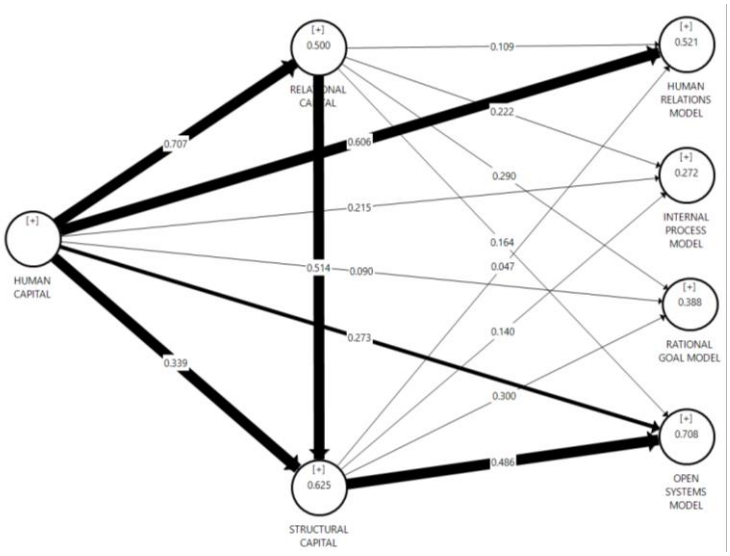
First step in assessment of the structural models (Fig. 2) is to check if there are collinearity issues by examining variance inflation factor values (VIF) of all sets of predictors in structural model. VIF values are between 1 and 2.701 in case of product-oriented organizations and between 1 and 3.625 in case of service-oriented organizations. These VIF values are below the threshold of 5 so it can be concluded that collinearity is not an issue. Coefficient of determination R^2, cross-validation redundancy coefficient Q^2 and direct and indirect path coefficients are examined to evaluate predictive relevance of the model. Final target latent constructs (organizational effectiveness models) have R^2 values between 0.272 and 0.611 in case of product-oriented organizations and between 0.268 and 0.647 in case of service-oriented organizations, which are moderate according to the thresholds of 0.25, 0.5 and 0.75 that indicate weak, moderate and substantial level of R^2 (Henseler et al., 2009; Hair et al., 2011). All these R^2 values are relatively satisfactory taking into consideration that each organizational effectiveness model has maximum 3 predictors. To determine statistical significance of the direct and total effects, bootstrapping procedure is performed and BCa bootstrapping confidence intervals are observed (Aguirre-Urreta & Rönkkö, 2018).

In case of product-oriented organizations, proposed structural model provides the highest explained variance of the open systems model (70.8%) and the lowest one for the internal process model (27.2%). Only structural capital has the significant direct effect (0.486) on the open systems model at significance level of 5%. Additional, at the significance level of 10%, human capital has direct effect on open systems model. In case of other remaining organizational effectiveness models, there are no significant direct effects of intellectual capital dimensions except of strong direct effect of human capital (0.606) on human relations model (explained variance 52,1%). In case of service-oriented organizations, proposed research model provides almost similar results: the highest explained variance of the human relations model (56.8%) and open systems model (55.5%) and the lowest one for the internal process model (26.8%). Structural capital has stronger significant direct effects on rational goal model (0.456) and open systems model (0.393) than direct effects of relation capital on rational goal model (0.381) and open systems model (0.268) are, at significance level of 5%. At significance level of 10%, there is additional direct effect of structural capital on internal process model (0.298). To conclude, proposed structural model in substantial level provides explanation of the organizational effectiveness models that share flexibility as value dimension (open systems model and human relations model) regardless of the organization orientation. Mutual direct effects of intellectual capital dimensions are significant in product-oriented organizations at significance level of 5% which is not case in service-oriented organizations

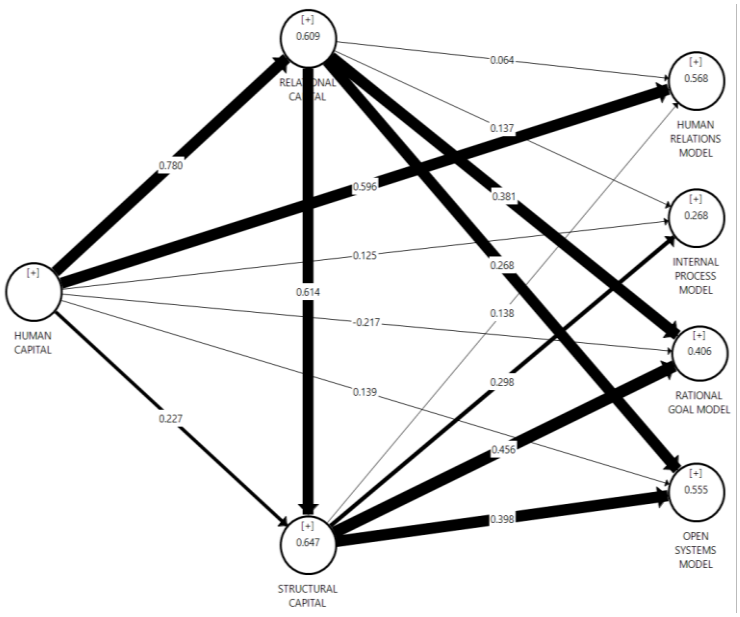
where direct effect of human capital on structural capital becomes significant at significance level of 10%. The strongest direct effect has human capital on relational capital in both types of organizations followed by significant direct effect of relational capital on structural capital (these effects are more pronounced in service-oriented organizations).

Relation capital has stronger direct effect on structural capital than human capital has, regardless of organization type. Explained variance of structural capital is 62.5% for product-oriented and 64.7% for service-oriented organizations, which is in accordance with previous studies where R^2 values are between 56.5 % and 69% (F-Jardon & Martos, 2009; St-Pierre & Audet, 2011). It is important to emphasize that these R^2 values are relatively high considering that the proposed model only considers the effects of human capital and relational capital as predictors of the structural capital. Human capital has stronger direct effect on relational capital in service-oriented organizations compared to product-oriented organizations, followed by higher explained variance of relational capital in service-oriented organizations (60.9%). These results are in line with previous studies where explained variance of relational capital is 56% (Bontis et al., 2000). Direct effects of each latent construct, their significance at 5% and 10% level of significance as well as explained variance of the constructs are shown in Fig. 2.

Figure 2. Structural models – significance of direct effects at 5% and 10% level of significance



Model 1 – Product-oriented organizations



Model 2 – Service-oriented organizations

significant at p <0.05
significant at p <0.10
not significant

Source: Author

In case of product-oriented organizations, human capital has the strongest total effects on open system model (0.73) and human relations model (0.715) and the lowest total effect on internal process model (0.47). In case of service-oriented organizations, human capital has also significant total effects on all organizational effectiveness model. As in case of previous organizations' type, service-oriented organizations exhibit stronger total effects on organizational effectiveness models that share flexibility as value dimension with more pronounced effect on human relations model (0.743) than indicated total effect of human capital in case of product-oriented organizations. Even though human capital has significant only direct effect on human relations model through mediators such as relational capital and structural capital, human capital exhibits significant total effects on all organizational effectiveness models.

It is important to consider total effects of each latent construct on target endogenous constructs such as organizational effectiveness models because mediation is present in the PLS path model. Total effects represent the sum of

direct and indirect effects of latent constructs on target endogenous constructs. Total effects of certain latent constructs on target endogenous constructs are shown in Table 3. Even though some intellectual capital dimensions do not have significant direct effects on particular organizational effectiveness model they might have indirect effects, through other intellectual capital dimension, on observed organizational effectiveness model.

Table 3. Total effects, bootstrapping procedure results and predictive relevance of the PLS path model

	f^2 effect size		Total effect (significance level)	
	Product-oriented organizations	Service-oriented organizations	Product-oriented organizations	Service-oriented organizations
Human capital → Internal process model	0,028	0,008	0,470 (0,000)	0,443 (0,000)
Human capital → Human relations model	0,332	0,305	0,715 (0,000)	0,743 (0,000)
Human capital → Open systems model	0,110	0,016	0,730 (0,000)	0,630 (0,000)
Human capital → Rational goal model	0,006	0,029	0,505 (0,000)	0,402 (0,003)
Human capital → Relational capital	0,998	1,556	0,707 (0,000)	0,780 (0,000)
Human capital → Structural capital	0,153	0,057	0,702 (0,000)	0,706 (0,000)
Relational capital→ Internal process model	0,025	0,007	0,294 (0,188)	0,320 (0,061)
Relational capital→ Human relations model	0,009	0,003	0,133 (0,536)	0,148 (0,332)
Relational capital→Open systems model	0,034	0,044	0,414 (0,001)	0,512 (0,000)
Relational capital→ Rational goal model	0,051	0,067	0,444 (0,003)	0,661 (0,000)
Relational capital→ Structural capital	0,352	0,418	0,514 (0,000)	0,614 (0,000)
Structural capital→ Internal process model	0,010	0,043	0,140 (0,520)	0,298 (0,058)
Structural capital→ Human relations model	0,002	0,015	0,047 (0,829)	0,138 (0,447)
Structural capital→ Open systems model	0,303	0,126	0,486 (0,000)	0,398 (0,002)
Structural capital→ Rational goal model	0,055	0,123	0,300 (0,143)	0,456 (0,000)

Source: Author

Relational capital has significant total effects on organizational effectiveness models that share external focus as value dimension – rational goal model

and open systems model regardless of organizations' type. These relational capital total effects on above-mentioned organizational effectiveness models are stronger in product-oriented organizations than in service-oriented organizations. Direct effects of structural capital are equal to its total effects on all organizational effectiveness models because no mediation is present in PLS path model for both types of organizations.

The f^2 effect size that could be weak, moderate and significant (≤0.02, <0.15 and ≥0.35) (Cohen, 1988) indicates the change of the coefficient of determination of endogenous construct in case of omitting certain predictor. The f^2 effect size values are shown in Table 3, while f^2 effect size values below 0.02 are considered negligible.

To detect predictive relevance of the PLS path models for product-oriented and service-oriented organizations, blindfolding procedure is applied. Results of cross-validation redundancy analysis show that Q^2 values (Stone, 1974) are between 0.165 and 0.479 in case of product-oriented organizations, and between 0.176 and 0.404 in case of service-oriented organizations. All obtained Q^2 values are above zero for all endogenous constructs, providing support for the structural models' predictive accuracy.

5. Discussion

Research results are in certain extant as expected but in the same time encouraging. According to author's knowledge, until now there are no empirical studies aimed to predict influence of intellectual capital on organizational effectiveness according to competing values approach in context of organizations in the Republic of Srpska, Bosnia and Herzegovina. It is obvious that there are differences in significance and intensity of the intellectual capital – organizational effectiveness relationship between product-oriented and service-oriented organizations. While examining the interdependence of intellectual capital dimensions, it can be concluded that there is the strongest positive relationship between human and relational capital regardless of the organization's type. Also, the intensity of this relationship is the strongest in complete structural model for both types of organizations. These findings provide support to hypothesis 1 in case of product-oriented and service-oriented organizations. Executives in organizations should fully exploit capacities of human capital to obtain market orientation of the organizations toward customer needs. The greater knowledge funds as well as competencies and skills that employees own, the higher possibility that they will be capable to recognize customer and stakeholders needs. In this way, organizations would be able to develop relational capital to gain and retain customer loyalty.

Findings show that significance of the relationship between human capital and structural capital are different in product-oriented and service-oriented organizations. Hypothesis 2 is confirmed only in case of product-oriented organizations. There is significant positive direct effect of human capital on structural capital in product-oriented organizations. This positive direct effect is insignificant in service-oriented organizations. These results show that product-oriented organizations have more developed capability to transform individual knowledge into organizational knowledge. Significant part of intellectual capital in product-oriented organizations is embodied in capital outlays such as equipment and machinery in capital-intensive organizations. The insignificant influence of human capital on structural capital in service-oriented organizations suggests that they are facing the challenge in finding the way how to codify or externalize employees' tacit knowledge. Some characteristics of services such as one-off using time and intangibility indicate impossibility to store and accumulate them as in case of material goods as tangibles. Impossibility to store services can indicate the more pronounced role of structural capital in product-oriented organizations.

Direct positive effect of relational capital on structural capital is significant and consistent regardless of organization orientation. These results provide support to hypothesis 3. Path coefficients suggest that all organizations have significant investments in enhancing market orientation and are capable to successfully satisfy customers' and other stakeholders' needs and wants. As a consequence, these organizations are capable to create efficient organizational routines, procedures and processes which enable them to continuously communicate and coordinate activities aimed to fulfilling their stakeholders' requests.

Hypothesis 4 is partially confirmed. Human capital has significant direct effect on human relations model regardless of organization orientation. This suggests that individual tacit knowledge, competences and skills encourage development of pleasant working environment and organizational culture that emphasizes employee morale and highly values human resources, employee ethics, training and cohesion. Structural capital has moderate significant positive effect on open systems model in both organization types. Organizations that determine adequate organizational structure and develop organizational procedures and routines in order to transform tacit knowledge and employees' skills and expertise into organizational knowledge owned by organizations even after employees live the organizations, have organizational culture and working atmosphere that positive influence their abilities to expand and adapt to external environment conditions and have highly growth, readiness, acquistions of resources, external support and adaptability. This provides organizations greater market shares and better competitiveness that leads to higher organizational performance. Additional, in case of service-oriented organizations, structural capital has more

pronounced direct effect on rational goal model than on open systems model. Obviously, service-oriented organizations have more active communication and collaboration with theirs' stakeholders that enable them to learn from mistakes, think outside of the box and find new ways of self-improving in satisfaying needs of all stakeholders. There are simultaneously flexible to acquire new resources and control focused to maximize output and achieve defined goals and plans. Findings show that relational capital is more important for organizational success of service-oriented organizations than product-oriented organizations given the need for collaboration with other organizations, primarily customers. This implies that these organizations invest heavily in becoming market-driven and stakeholder-focused that provide them capability to quickly response to environmental changes and achieve efficiency and productivity that yields substantial competitiveness.

Hypothesis 5 is partially confirmed. Human capital has substantial and significant total effect on all organizational effectiveness models regardless of organizational type. These total effects are more pronounced for organizational effectiveness model that emphasize flexibility and external organizational focus. The important implication for managers is contained in significant interdependence of intellectual capital dimensions in order to successfully manage organizational knowledge funds. Isolated knowledge in individuals' minds that are not externalised and codified into organizational knowledge could not have influence on organizational success. They have positive effect in domain of development of pleasant working atmosphere and environment that appreciate moral, ethics, tradition and loyalty of employee and their commitment to organizational goals accomplishment. However, it is not enough to employ individuals who own extraordinary knowledge and skills to achieve competitive advantage and high organizational performances. Organizations must encourage employees to share and exchange knowledge through organizational learning and to externalise to obtain codified knowledge when employees leave the organizations. In this way, tacit knowledge is retained in organizations through organizational systems, procedures, rules, databases and information systems. Even though relational capital does not have influence on effectiveness in case of product-oriented organizations and has significant direct effect only on certain organizational effectiveness models in case of service-oriented organizations, total effects analysis shows significant effects of relational capital on organizational effectiveness models that share values such as flexibility and external focus.

6. Conclusion

Research results indicate the importance of intellectual capital management and significant role of intangible resources in achieving competitive advantage

and high organizational performance. The aim of this research is to emphasize the relevance of intellectual capital management, as form of invisible assets, for enhancing organizational effectiveness in organizations of the Republic of Srpska, Bosnia and Herzegovina. According to author's knowledge, there are no present researches on relationship between intellectual capital and organizational effectiveness through competing values approach, especially in context of the Republic of Srpska, Bosnia and Herzegovina. It is proven that intellectual capital and interdependence of intellectual capital dimensions have significant effects on organizational effectiveness models according to competing values approach regardless of organization orientation. Obtained results suggest relevant implications for managers and emphasize the necessity to act in certain aspects of intellectual capital to improve organizational effectiveness in various domains. This pioneer research confirms validity and reliability of the questionnaire for measuring intellectual capital and organizational effectiveness in observed context. Psychometric characteristics of used measuring instruments are consistent with results in previous studies, in different countries, and are in line with theory on intellectual capital and competing values approach to organizational effectiveness. However, this research has some limitations and deficiencies. Further studies should also take into consideration objective measures for measuring intellectual capital and organizational effectiveness to obtain more detail and more comprehensive view into organizational functioning. Larger sample size of organizations would provide more valid results and conclusions for industry of the Republic of Srpska, Bosnia and Herzegovina. Following researches should test proposed research model and possibility to generalize findings in context of other countries and their industries.

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