

INFLUENCE OF KNOWLEDGE AND QUALITY ON BUSINESS PERFORMANCE OF COMPANIES IN SERBIA

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Original scientific paper

The paper presents results of research on the impact of knowledge and quality on business performance of companies. Data was collected by interviewing 296 managers from 140 companies in Serbia. Knowledge and quality showed a strong and positive impact on the business performance of companies in Serbia. Variables "Group knowledge" and "Systematic approach to quality" proved to have the greatest impact on variables "Employee performance" and "Development performance". Work experience as a moderator has shown to have a significant effect on relations between dimensions of knowledge and quality and dimensions of business performance. Factor analysis has shown two-component solution, where the first component gathers variables of knowledge and quality, and the second one variable of business performance, and a strong correlation was established between these two components. This study confirmed the importance of knowledge and quality in business improvement and competitiveness, where the focus is placed on the workers, with their knowledge, experience and readiness to adapt to changes in the business.

Keywords: *business performance; competitiveness; knowledge; quality*

Utjecaj znanja i kvalitete na poslovne performanse poduzeća u Srbiji

Izvorni znanstveni članak

U radu su prikazani rezultati istraživanja o utjecaju znanja i kvalitete na poslovne performanse poduzeća. Podaci su prikupljeni anketiranjem 296 menadžera iz 140 poduzeća u Srbiji. Znanje i kvaliteta su pokazali jak i pozitivan utjecaj na poslovne performanse poduzeća u Srbiji. Varijable "Skupno znanje" i "Sistemska pristup kvaliteti" pokazale su da imaju najveći utjecaj na varijable "Mogućnosti zaposlenih" i "Razvojne performanse". Radno iskustvo kao moderator pokazalo je da ima značajan učinak na relacije između dimenzija znanja i kvalitete i dimenzija poslovnih performansi. Faktorskom analizom dobiveno je dvokomponentno rješenje, gdje prva komponenta okuplja varijable znanja i kvalitete, a druga varijable poslovnih performansi, i utvrđena je jaka korelaciona veza između ove dvije komponente. Ovim istraživanjem je potvrđen značaj znanja i kvalitete u unapređenju poslovanja i konkurentnosti, gdje se fokus stavlja na radnika, sa svojim znanjem, iskustvom i spremnošću da se prilagođava promjenama u poslovanju.

Ključne riječi: *kvaliteta; konkurentnost; poslovne performanse; znanje*

1 Introduction

This paper presents a research that deals with the analysis of the impact of knowledge and quality on the promotion of business performance and competitiveness of the companies in Serbia and their mutual relations.

The importance of knowledge, as the key factor of competitiveness, is constantly increasing. The aim of this research is to ascertain to which degree the companies comprehend the importance of this resource, how much they care for the development of their employees and the promotion of their competences. The education on quality and its promotion should be, without any doubt, observed at the same time. The implementation of quality standards in a company does not enable the improvement of the business performances and does not bring significant effects, if one does not simultaneously work on the training and education of the employees, and on raising the awareness of the importance of developing quality as a common goal. Through knowledge creation and quality management, one realizes the complementary and independent impact on the organizational performances through the process of the organized learning [1]. The basic goals of dealing with knowledge and quality are the same - to create the organizational knowledge, which can bring the improvement and promote competitiveness [2÷4].

2 Theoretical background

The key factors for achieving competitiveness are knowledge and quality. By improving its knowledge, a company creates a favorable environment for carrying out

the quality system successful managing, which is certainly the precondition for competitiveness development in the global environment. In order to make knowledge the resource of competitive advantage, the companies have to coordinate the strategy of knowledge improvement with their business strategy [5].

According to the research [6], high technologies, innovations and development, high quality of human capital and knowledge advancing distinguished themselves as the key factors in the developed countries. According to [7], the business environment entered the era of knowledge where knowledge became power, and quick learning and competence showed a strong tendency towards success.

The aim of successful knowledge development is the improvement of business operations [8]. Zack et al. [9] established a positive direct relationship between the knowledge management practice and organizational performance. The effective knowledge management that covers the whole organization leads to development of the competitive advantages, innovations and to organizational learning. According to a study [10] the training does not have a direct effect on performance, but has an indirect effect, improving, among other variables organizational learning.

According to Akdere [11], quality management applies knowledge management as one of its basic components. Knowledge management is the key element in the process of achieving business excellence. Without knowledge exchange in an organization, quality management cannot achieve its positive effects. Employees are mentioned as a very important factor in achieving the quality of products and processes [12].

Total Quality Management (TQM) is a comprehensive and structured approach to organizational management that tends to improve the quality and productivity in business organizations. TQM refers to a management approach to planning and implementing continuous improvement throughout the entire firm for performance improvement [13][14]. Hung et al. [15] showed that TQM was a mediator between knowledge management and innovation. On the contrary [16], considered knowledge transfer is to be the mediator between TQM and performance. While some researchers considered knowledge management to be a facilitator of TQM [17][18], the other scholars saw TQM as an antecedent to knowledge management [19-21].

Quality management is connected with the theoretically founded organizational knowledge through its processes of the continuing endeavor investment, cooperative knowledge creation, and adaptation to the consumers' changes and needs [22]. The effective quality improvement depends on the organization's influence on the cognitive processes of its members, and presents problems as possibilities for learning [5].

The implementation effects of the quality system on the business operations are confirmed in many researches. They show a strong impact on the improvement of business performances, production quality and total competitiveness [23], while according to the other researches [24], a greater participation of the employees and their motivation, as well as a greater clients' pleasure have been observed. By improving business performances, the company becomes more competitive by improving the quality, delivery, flexibility and by reducing the expenses [25].

The research results among large Slovenian companies show that the systematic use of quality approaches and tools as well as taking part in the award process including external assessment, has a positive effect on the development of TQM principles, organizational performance and financial results [26]. According to a research conducted among Serbian companies [27] only quality tools for reviewing current condition (for decision making) have an important impact on financial performance measures. Some findings suggest that the cancelled ISO 9001 certificate could be understood as an early external signal indicating possible business problems in the organization [28]. According to research [29] quality managers consider expertise, knowledge and quality of preparation of the firm's staff for audit as the most important factors, while the external auditors put the expertise and professionalism of auditors in the first place.

3 The research structure, hypotheses and methodology

The research was organized in the Republic of Serbia during 2015. The data were collected by electronic means with the help of an e-mail survey and by field surveys, by interviewing 296 managers from 140 companies. A methodologically adapted questionnaire was created for the research. For data analysis we used the software SPSS Statistics 20.

The targeted group in the research were the companies engaged in production or services which

conduct their business on the territory of the republic of Serbia and the business operations of which are based on the quality standard application (in the first place ISO 9001, and then also ISO 14001, OHSAS 18001, HACCP and others).

The size of the statistical sample is 140 companies, which includes 7,1 % of micro, 31,4 % of small, 32,1 % of medium and 29,3 % of large companies. According to the data [30], the number of certified companies of ISO 9001 standard in Serbia during 2014 was 2637, and the size of the statistical sample represented 5 % of all certified companies. The research was conducted in 82,1 % private structure companies and 17,9 % state structure companies.

The goal of the study was to determine the relations between dimension of knowledge and quality and dimension of business performance. This study proves the following hypotheses:

- H1: Knowledge has a statistically significant correlation with business performance of the company.
- H2: Quality has a statistically significant correlation with business performance of the company.
- H3: Work experience has a significant effect on correlation between dimension of knowledge and quality and dimension of business performance.

Knowledge is seen through three variables in the company: "Individual knowledge", "Group knowledge" and "Organizational knowledge". Individual knowledge is related to readiness of an employee's personal development, training in business and creating new ideas. Group knowledge is related to functioning of groups - teams in the company, their flexibility and willingness to share knowledge and experiences. Organizational knowledge is related to organizational structure and climate in the company. It is analyzed to which extent it is effective, innovative and whether it stimulates creation of knowledge through the training and development of employees.

The quality of a company is analyzed through four variables: "Inclusion of all employees", "Systematic approach to quality", "Process management approach" and "Continuous improvement". Variable Inclusion of all employees assesses the extent to which employees are involved in achieving the objectives of quality and continuous improvement. Systematic approach to quality defines the connection between processes and operations in a company and compliance with product quality requirements. Process management approach shows how the processes in the company are identified, demarcated and documented with procedure. Continuous improvement demonstrates the extent to which the processes are monitored and improved, and how many are dedicated to improvement and development of products and services. Variables of knowledge and quality were graded using Likert scale which consists of five degrees, where one (1) is "completely disagree", and five (5) is "strongly agree".

Business performance of the company was seen through six variables. Development performance evaluated investment in research and development, the conquest of new markets and the readiness of the

company to respond to changes in the environment. The performance of employees indicates the level of trust and cooperation between managers and employees, and motivation of employees. Operating performances show compliance of organizational divisions and capacity utilization. Financial performances assess financial performance indicators. The last two variables evaluate the level of corporate social responsibility and export orientation of enterprises. Variables of business performance are assessed using semantic differential scale where the values range from 1-7, where one is low and seven is high.

3.1 Correlation and regressive analysis between knowledge, quality and business performance dimensions

On the basis of the correlating relation among the dimensions of knowledge and quality and dimensions of business performance in the companies in Serbia, we shall prove the assigned hypotheses.

Tab. 1 presents results of descriptive statistics (minimum, maximum, average value and standard deviation) for dimension of knowledge and quality and dimension of business performance. The table contains abbreviations of variables that will be used in further work.

Table 1 Descriptive Statistics for the dimensions of knowledge, quality and business performance

Variables	Mark	N	Min	Max	Mean	Std. Deviation
Individual knowledge	K1	296	1	5	3,34	,873
Group knowledge	K2	296	1	5	3,08	1,040
Organizational knowledge	K3	296	1	5	3,25	1,018
Inclusion of all employees	Q1	296	1	5	3,44	,922
Systems approach to quality	Q2	296	1	5	3,59	,927
Process management approach	Q3	296	1	5	3,48	,956
Continuous improvement	Q4	296	1	5	3,40	1,139
Development performance	BP1	296	1	7	4,98	1,326
Performance of employees	BP2	296	1	7	4,69	1,380
Operating performance	BP3	296	1	7	4,88	1,357
Financial performance	BP4	296	1	7	4,90	1,153
Social responsibility	BP5	296	1	7	4,24	1,321
Export orientation	BP6	296	1	7	4,75	1,534

Tab. 2 presents the results of the correlational analysis of the correlational dimensions of knowledge and quality to the dimensions on business performance. These results refer to the total sample of respondents ($N = 296$). The Pearson correlation was used. Tab. 2 shows a statistically significant correlation between the dimension of knowledge and quality and dimensions of business performance. All correlations are strong and positive. This proves hypothesis H1 and H2.

Table 2 Pearson Coefficients of Correlation between knowledge, quality and business performance dimensions

MARK	BP1	BP2	BP3	BP4	BP5	BP6
K1	,367**	,493**	,315**	,418**	,412**	,319**
K2	,444**	,683**	,420**	,467**	,532**	,218**
K3	,492**	,648**	,414**	,495**	,477**	,277**
Q1	,632**	,441**	,486**	,566**	,414**	,397**
Q2	,577**	,462**	,531**	,610**	,430**	,400**
Q3	,509**	,479**	,472**	,590**	,406**	,326**
Q4	,504**	,519**	,432**	,525**	,520**	,308**

Statistically significant correlations are indicated as follows:

* $p < 0,05$; ** $p < 0,01$.

The biggest correlation to the development performance was showed by variables Q1 and Q2. By the inclusion of all employees in the implementation of quality and systematic approach to quality management the company's operations will be much more effective and efficient, which will ensure company's growth, development and penetration to new markets. Strong and positive correlation to employee performance showed knowledge variables K2 and K3. Although individuals are willing to personal development and training in business,

only with team collaboration and organizational climate that encourages the creation and sharing of knowledge, employees will realize better business results. The quality variable Q2 showed a significant correlation with operational performances. A clear definition of the order and connections between processes and operations in a company will enable higher capacity utilization and compliance activities of the organizational parts. A significant correlation with financial performance was shown by quality variables Q2 and Q3. This indicates that adequate implementation of quality systems in a company will improve business and higher capacity utilization, which will have a positive impact on the financial result. Strong and positive correlation to social responsibility was shown by knowledge variable K2 and quality variable Q4. The importance of team cooperation, and cooperation of employees with colleagues from other companies, is pointed out once again. Variables of knowledge and quality showed little correlation with the variable of export orientation. The biggest correlation was shown by quality variable Q2. Systematical approach to quality ensures that the product is in compliance with the quality requirements and, as such, is competitive on the international market. Systematic quality management and standardization of business enterprises ensures breakthrough on the international market.

Regression analysis determined the effect of the predictor dimension of knowledge and quality (dependent variables) to the dimensions of business performance (dependent variable). Tab. 3 presents the results of regression analysis, while the labeled values represent statistically significant variables whose value is $Sig. < 0,05$.

Table 3 Regression Analysis (Dependent Variable: BP dimensions; Predictors: K and Q dimensions)

Dependent	Independent	β	t	Sig.	R^2	F	Sig.
BP	K1	-,041	-,720	,472	,473	36,959	,000 ^b
	K2	-,024	-,304	,761			
	K3	,190	2,394	,017			
	Q 1	,407	6,335	,000			
	Q 2	,243	3,495	,001			
	Q 3	-,009	-,128	,899			
	Q 4	,025	,392	,695			
BP2	K1	,115	2,140	,033	,532	46,743	,000 ^b
	K2	,397	5,423	,000			
	K3	,151	2,022	,044			
	Q 1	-,083	-1,373	,171			
	Q 2	,040	,612	,541			
	Q 3	,065	,966	,335			
	Q 4	,179	2,967	,003			
BP3	K1	-,045	-,707	,480	,343	21,439	,000 ^b
	K2	,156	1,796	,074			
	K3	,023	,263	,793			
	Q 1	,177	2,469	,014			
	Q 2	,295	3,805	,000			
	Q 3	,068	,854	,394			
	Q 4	,015	,209	,835			
BP4	K1	,028	,495	,621	,467	36,009	,000 ^b
	K2	,054	,687	,493			
	K3	,097	1,217	,224			
	Q 1	,172	2,655	,008			
	Q 2	,252	3,598	,000			
	Q 3	,162	2,245	,026			
	Q 4	,068	1,049	,295			
BP5	K1	,152	2,454	,015	,619	25,509	,000 ^b
	K2	,320	3,800	,000			
	K3	-,050	-,581	,561			
	Q 1	-,044	-,630	,529			
	Q 2	,111	1,475	,141			
	Q 3	-,057	-,737	,462			
	Q 4	,323	4,661	,000			
BP6	K1	,163	2,335	,020	,217	11,395	,000 ^b
	K2	-,167	-1,760	,079			
	K3	,098	1,011	,313			
	Q 1	,225	2,874	,004			
	Q 2	,250	2,954	,003			
	Q 3	-,082	-,938	,349			
	Q 4	,038	,485	,628			

Tab. 3 shows the high value of the index R^2 , which ranged from 0,217 to 0,619. In this way, effects of knowledge and quality on business performances of companies in Serbia have been confirmed, thus confirming hypothesis H1 and H2. Based on the value of R^2 it was found that variables of knowledge and quality have the highest impact on BP5, social responsibility ($R^2 = 0,619$) and BP2, employee performance ($R^2 = 0,532$). Variables that provide statistically significant contribution to the business performance are K2, Group knowledge and Q4, Constant improvement. For efficient development of employee performance, team cooperation, exchange of knowledge and new ideas within the group are crucial, as well as encouraging cooperation between employee groups and employee groups from other companies. Continuous improvement of business processes leads to improved performance, but also encourages socially responsible business enterprise. Variables Q1, Involvement of all employees and Q2, Systematic approach to quality have the most significant

impact on BP1, development performance ($R^2 = 0,473$) and BP3, operational performance ($R^2 = 0,343$), while variable Q2 has shown the greatest impact on BP4, financial performance ($R^2 = 0,467$) and BP3, operational performance ($R^2 = 0,343$). From the above, it can be confirmed that the variable Systematic approach to quality has the greatest impact on the business performance of the company. Therefore, proper implementation of quality system leads to improved performance, while engaging all employees in achieving quality objectives further contributes to improvement

3.2 Work experience as a moderator of the relationships between knowledge, quality and business performance dimensions

Tab. 4 shows the correlation between the dimension of knowledge and quality and dimension of business performance in terms of work experience of the respondent. Work experience in present job less or greater

than 5 years, was taken as moderator. Tab. 4 shows little correlation between the observed variables whose work experience is less than 5 years, while with respondents that have more than 5 years of work experience a strong correlation exists between observed variables. This is confirmed by hypothesis H3.

Table 4 Correlation Coefficients between K and Q Dimensions and BP Dimensions

	M.	BP1	BP2	BP3	BP4	BP5	BP6
work experience < 5 years	K1	,089	,133	-,056	,130	,073	,099
	K2	,263**	,578**	,169*	,215*	,346**	-,163
	K3	,300**	,531**	,193*	,244**	,162	-,064
	Q1	,533**	,162	,279**	,397**	,126	,146
	Q2	,276**	,163	,320**	,479**	,104	,130
	Q3	,242**	,174*	,261**	,425**	,176*	,038
	Q4	,330**	,350**	,235**	,344**	,422**	,012
work experience > 5 years	K1	,466**	,625**	,469**	,513**	,534**	,440**
	K2	,514**	,712**	,544**	,568**	,611**	,445**
	K3	,577**	,688**	,528**	,603**	,620**	,491**
	Q1	,671**	,560**	,581**	,629**	,528**	,539**
	Q2	,723**	,624**	,636**	,666**	,577**	,556**
	Q3	,647**	,637**	,591**	,671**	,518**	,519**
	Q4	,610**	,632**	,554**	,628**	,577**	,518**

Statistically significant correlations are indicated as follows:

* $p < 0,05$; ** $p < 0,01$.

For respondents whose work experience is less than 5 years, the variable of knowledge and quality showed a significant correlation on business performance BP1, BP2, BP4 and BP5. None of the variables showed significant correlation with business performance BP3 and BP6. Knowledge variable K1 showed a slight correlation with business performance variable. For respondents whose work experience is more than 5 years, all the values show a significant link between the

observed variables, while a distinct correlation was established between variables Q2 and BP1, K2 and BP2. These correlations prove the significance of group knowledge and team cooperation in improvement of employee performance and systematic approach to quality management in the growth performance of the company.

Effect of work experience has shown that with a longer career in a given place and in a specific company, employees are willing to self-improve and are ready for personal training, to create orientation towards teamwork and sense of belonging to the organizational culture of the company. They recognize the importance of implementation of quality systems and constantly work on continuous improvement and development of business processes. Employees with less work experience do not recognize effects of systematic quality management, do not accept the changes and show resistance to them. The quality is not perceived as a personal responsibility. Team cooperation is expressed, however, employees are not ready for change and creation of new ideas.

3.3 Factor analysis of the dimensions of knowledge, quality and business performance

The analyzed variables of knowledge, quality and business performance are factors of business improvement and competitiveness. From this aspect factor analysis is performed. Data is suitable for analysis, given that there is a great interdependence of factors because the value of all correlation coefficients is over 0,3. Value of KMO indicators is 0,890, which exceeds the recommended value of 0,6, while Bartlett's test of sphericity reached statistical significance, all of which points to the factorability of the correlation matrix.

Table 5 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7,188	55,294	55,294	7,188	55,294	55,294	6,175
2	1,296	9,972	65,266	1,296	9,972	65,266	5,555
3	,998	7,675	72,941				
4	,700	5,386	78,327				
5	,555	4,267	82,594				
6	,483	3,714	86,308				
7	,419	3,222	89,529				
8	,378	2,908	92,437				
9	,269	2,070	94,507				
10	,233	1,793	96,300				
11	,203	1,562	97,862				
12	,157	1,209	99,071				
13	,121	,929	100,000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Principal component analysis revealed presence of two components with characteristic values that are more than 1, which explained 55,29 % of variability and 9,97 % of variability. This two-component solution explained a total of 65,26 % of variability. To make these two components easier to interpret, Oblimin rotation was performed.

Rotated solution revealed that the two components have many big factor weights, and that all variables give a considerable weight, greater than 0,5, to only one of the components. For the first component the biggest factor weight showed knowledge variables K1, K2 and K3, BP2, employee performance, and then quality variables Q1, Q2, Q3 and Q4. The second component has gathered the factorial weight of other business performance variables

BP3, BP6, BP4, BP1 and BP5. Knowledge variable preceded quality variables, which indicates that adequate training and development of employees is the precursor of efficient quality management. Component 1 has rounded up all the variables that put employee, including his knowledge, experience, readiness for further development and involvement to continuous improvement of process, into focus. Component 2 has gathered all the variables that are essential for business improvement and competitiveness, operating performance, export orientation, financial performance, development performance and social responsibility. Between these two components exists a strong positive correlation ($r = 0,555$).

Table 6 Pattern Matrix^a

MARK	Component	
	1	2
K2	,950	
K3	,925	
K1	,763	
BP2	,631	
Q3	,613	
Q4	,610	
Q1	,562	
Q2	,505	
BP3		,885
BP6		,841
BP4		,805
BP1		,658
BP5		,590

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 8 iterations.

Factor analysis confirmed the interdependence of knowledge and quality on business performance. Improving the knowledge and quality of the company achieves positive effects on promotion business performance and competitiveness. This once more confirms the hypothesis H1 and H2.

4 Conclusion

In this study the relationship between knowledge, quality and business performance has been established. Knowledge is the precursor for effective quality management, while quality has a great impact on improving business performance.

Similar to previous studies [1÷5, 8, 9], the influence of knowledge and quality on improvement of organizational performance and competitiveness has been confirmed. While some scientists saw quality as a predecessor to knowledge management [19÷21], our results confirm the claim of researchers that consider knowledge as the moderator of quality [11, 15, 17, 18].

The positive effects of the application of quality management systems in business operations are confirmed in many studies [23÷25] while our results confirm that the quality has the greatest impact on promotion of development and operating performance of the company.

Team cooperation and organizational climate which fosters the creation of knowledge through training and

development of employees, preceded by the establishment of an effective quality system. Employees with longer work experience are more devoted to organizational climate, inclined towards team cooperation and easier accept change and adopt it. By improvement of performance of employees, including all employees in implementation of quality and continuous improvement processes, quality system will generate positive effects on business. Efficient quality system will enable the improvement of the quality of development and operating performance, which will be reflected in the improvement of financial indicators.

Quality contributes to competitiveness promotion but, without adequate education and developing the awareness of quality achieving, it will be hard to reach a higher level of doing business. If a company wants to improve its competitiveness and its business operations, the employees have to be trained in accordance with the quality program and directed towards team work and quality achievement as a common goal.

With regard to the specifics of the transitioning economies, such as the one in Serbia, which was the subject of the research, the results may serve economies that are facing similar problems. They can be used for further research in this area and for analysis of adequate forms of training and development of employees who may have a significant impact on development of quality aspect, as well as the harmonization of the learning processes with goals of organization in terms of improvements of quality.

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