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Contents

Specific influence of knowledge intensive and capital intensive organizations on collaborative climate and knowledge sharing in SMEs

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Abstract

In this paper, the authors discuss knowledge management, with a focus on knowledge sharing. Knowledge sharing is dependent on trust and cooperation, which are elements of organizational culture. One specific aspect of organizational culture is of particular interest for knowledge sharing. This aspect consists of values, beliefs and atmosphere that characterize common mental space accepted by knowledge workers which affect behavior and readiness to share knowledge. This aspect of organizational culture is called collaborative climate and can be described as the 'permeability' of the human infrastructure for knowledge sharing. Collaborative climate in an organization can be considered as an environment that provides support to knowledge workers to create new knowledge that will be translated into a value, which will become competitive advantage of an organization. A questionnaire for assessing two dimensions of the collaborative climate: Organizational Culture and Employee Attitude was used as an instrument in this research. The main research questions in this paper are: 1) Is there a statistically significant difference between attitudes towards collaborative climate of managers and employees? 2) Is there a statistically significant difference between attitudes towards collaborative climate in capital intensive and knowledge intensive organizations? Research hypotheses emerged from the main research questions.

The survey was conducted in order to answer research questions. Data collection was carried out in 2016 throughout the territory of the Republic of Serbia. The sample in this research consisted of 114 managers from 78 randomly selected SMEs from the database of the National Agency for Regional Development. Afterwards, 647 employees were surveyed from those same companies, and in total 761 valid responses were collected. Principal component analysis was applied to the data. In order to check for statistically significant differences, factor scores were tested using Leven's homogeneity test of variance and t-test. Data analysis indicated the existence of statistically significant differences between employee and managers attitudes in their assessment of collaborative climate in capital intensive and knowledge intensive organizations.

Introduction

The importance of small and medium-sized enterprises (SMEs) in the process of consolidating the economies of countries that are exposed to the processes of transition from industrial economy to the knowledge economy, ownership and social transition is unquestionable. According to the report by the European Bank for Reconstruction and Development (EBRD) for 2016, SMEs account for over 99% of the total number of enterprises in the countries in which the EBRD is active (European Bank for Reconstruction and Development, 2019). SMEs are the engine of economic development of any country and they account for more than 85% of new jobs and provided two-thirds of the total private sector employment in the EU in the past 5 years (European Commission, 2019; de Wit and de Kok, 2014).

In the Lisbon Strategy adopted in 2000, the main goal was to make the European Union the most competitive and dynamic knowledge economy in the world by 2020 (European Committee of the Regions, 2019). Bearing in mind that SMEs make up the majority of enterprises, it clearly follows that the measures and policies that have been undertaken to achieve the EU's strategic goal are aimed at SMEs. Thus, in 2005 in the revised Lisbon Strategy, the Council of Europe adopted the "Integrated guidelines and specific areas for priority actions" (European Committee of the Regions, 2019) among which are:

- greater investment in knowledge and innovation,
- unlocking business potential, especially for SMEs.

In 1996 OECD report it was argued that the economies of member states were increasingly based on knowledge and information (Organization for Economic Cooperation and Development, 2019). Knowledge is recognized as the most important resource, as a driver of productivity and economic growth. The interest of the scientific and professional public is focused on understanding the knowledge based economy and its characteristics relative to the traditional economy, the capital based economy.

With the knowledge economy, new topics and questions sprouted in regards to the implications of different characteristics of knowledge as a basic resource, compared to capital as the basic resource of an industrial economy. In response to this

challenge, emerged Knowledge Management (KM). Knowledge management has become an important factor in achieving and maintaining competitive advantage. Processes of integrating individuals' knowledge into organizational knowledge, and processes of combining organizational knowledge that leads to the desired performance resulting in competitive advantage of the organization, have become essential. Given that the vast majority of initiatives in these processes depend on knowledge sharing, this becomes the most important aspect within KM.

1. Knowledge management

The bulk of papers dealing with KM refer to large enterprises. Applying good experiences from large organizations to SMEs by simply scaling is not a correct approach because SMEs do not have the same characteristics as large enterprises (Sparrow, 2005). In response to this, there is a new theory and practice relating to KM in SMEs (Durst & Edvardsson, 2012; Cerchione, Esposito & Spadaro, 2016).

The first wave of KM was actually management of explicit knowledge, i.e. data and information. This wave has transformed the industrial society into information society. In the information society, the codification of knowledge and its transfer through communication and computer networks was of paramount importance. There is no disagreement in the scientific community about the importance of IT for locating, storing, accessing and sharing explicit knowledge. In a situation when we are buried with data and information, the organization's ability to manage data and information flows and thus ensure the selection of relevant information and data could be considered a competitive advantage. However, the systems for managing explicit knowledge are fairly transparent and relatively easy to replicate. This means that they cannot be the source of a sustainable long-term competitive advantage (Petrov, Trivić & Ćelić, 2018).

The importance of non-codified knowledge (tacit knowledge) and its diffusion require better understanding of knowledge networks. Man is the only active agent of a non-codified knowledge, which means that man is the basic unit of knowledge networks. It is clear how the capacity of computer networks to transmit codified knowledge is defined, but the question is what impacts the capacity of human knowledge networks to transmit non-codified knowledge? Knowledge networks are social networks, and their effectiveness depends on

trust among people who make up the network. Unlike the formalized structures in the organization, knowledge networks are informal and difficult to identify because they intertwine with both functions and hierarchy. Less structured work environments give individuals opportunity to creatively solve problems and thus encourage experimentation and innovation (Nica, 2018; Kral, Janoskova, Podhorska, Pera & Negurița, 2019).

2. Collaborative climate

Peter Drucker (1999) emphasized that one of the greatest challenges of management in the twenty-first century would be how to increase the productivity of knowledge workers. Developed countries will retain their advantage only if they improve the productivity of knowledge workers as they have improved the productivity of manual workers in the industrial economy. Productivity is related to norming and it has been defined by the capacity of technological lines in the industrial economy. The productivity of knowledge workers cannot be controlled in this way.

An alternative approach is necessary - an approach where the focus is on the bearer of knowledge and on the context in which knowledge is created and shared, i.e. the focus on collaborative climate. The view that knowledge is embedded and constructed inside social networks has been argued by Nonaka & Takeuchi (1995). They state that knowledge cannot be processed in the same way as information because it is continually redefined and reconstituted through dynamic and interactive social networks. Knowledge can be shared if there is mutual respect, attention, and understanding (Nonaka & Takeuchi, 1995; Sveiby, 1997). Exchange of tacit knowledge requires a culture suitable for this type of sharing. Integration of knowledge among communities within organizations is the most dependent on people, and organizational culture (Davenport & Prusak, 2000).

Organizational culture defines values and beliefs that form an integral part of what we choose to notice and accept. Organizational culture also imposes a common, generally accepted perception of reality about how things look and how they should look (Davenport & Prusak, 2000). The culture of a group defines willingness and conditions under which an individual would share knowledge with other members of an organization. Knowledge sharing is inseparable from the organizational culture.

KM literature emphasizes the following concepts: knowledge transfer, knowledge sharing and knowledge transfer barriers (Paulin & Suneson, 2012). Knowledge sharing is more often in the focus of authors who approach KM at the individual level, while knowledge transfer is the focus of authors who deal with KM at group, or organizational level. It is of paramount importance to understand all three concepts in the context of KM as well as their interrelation.

In this paper, the authors analyze KM, with focus on knowledge sharing. Sharing of knowledge depends on trust and cooperation, which are considered elements of organizational culture. Sveiby and Simons (2002) emphasize importance of one specific aspect of organizational culture for knowledge sharing. This aspect consists of values, beliefs and atmosphere that characterize a common mental space accepted by knowledge workers which affect behavior and readiness to share knowledge. This aspect of organizational culture is called collaborative climate and described as 'permeability' of the human knowledge sharing infrastructure (Uzelac, Ćelić, Petrov, Drašković & Berić, 2018; Sveiby & Simons, 2002; Sveiby, 2007). A collaborative climate in an organization can be considered as an environment that provides support to knowledge workers for creation of new knowledge which could be translated into value and competitive advantage for the organization.

Virtual space called collaborative climate can be divided into levels: the individual level of the employee, the level of the group that makes the closest environment, and the level of the organization that creates the mental context. Having in mind the characteristics of the collaborative climate Sveiby & Simons (2002) have identified and isolated factors that influence knowledge sharing, trust, and cooperation.

These factors are grouped into four dimensions with five statements and constitute instrument for assessment of collaborative climate, Collaborative Climate Assessment (CCA) Instrument:

- a group of statements describing the attitudes of the respondents, Employee Attitude;
- group of statements describing the behavior of a colleagues closest to the respondent, which refers to the sharing of knowledge, Work Group Support;
- a group of statements describing the behavior of the nearest superior manager, Immediate Supervisor;

a group of questions that relate to leadership factors outside the respondent's personal closest work environment, Organizational Culture.

3. Research

In this paper, the authors aim to:

- assess the level of development of the collaborative climate in SMEs in Serbia and
- examine whether the type of economy to which SMEs belong (knowledge intensive organization – KIO from knowledge based economy or capital intensive organization – CIO from capital based economy) (Petrov et al., 2019) have an impact on the level of development of the collaborative climate.

The goal of the research in this paper is to contribute to better understanding of the organizational characteristics in SMEs which represents powerful driving force for Serbia's economic development. The authors' second goal is to propose directions for the development of collaborative climate in organizations from KIO and CIO segments of SMEs based on the results of this research.

3.1. Sample

The research was carried out on data collected during 2016 on the entire territory of Republic of Serbia (Ćelić, 2016). The sample in this research consisted of 114 managers from 78 randomly selected SMEs from database of the National Agency for Regional Development of Serbia. Afterwards, 647 employees from those same companies, were surveyed. In total, 761 valid responses were collected. From CIO segment in total there were 551 (72.4%) respondents and 210 (27.6%) were from KIO. There were 102 (13.4%) top executives, 87 (11.4%) middle managers, and 572 (75.2%) employees. Out of the total number of respondents, 212 (27.9%) of them were up to 30 years of age, 306 (40.2%) were older than 30 and younger than 41, 151 (19.8%) were older than 40 years and younger than 51, and 92 (12.1%) were older than 50. When it comes to respondents' gender 470 (61.8%) were male and 291 (38.2%) were female. Figure 1 represents demographic characteristics of survey respondents.
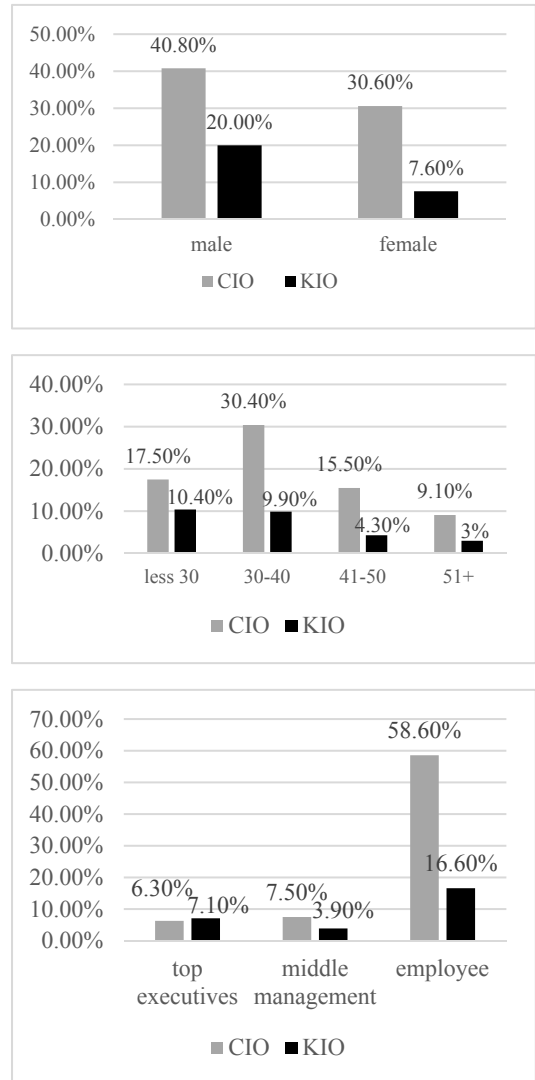
Figure 1 Demographic characteristics of survey respondents
Source: The authors

3.2. Instrument

A questionnaire was used as an instrument for the assessment of two dimensions of the collaborative climate in this research. It was adopted from Sveiby and Simons (2002) "Collaborative Climate Assessment" - CCA. Two dimensions of the collaborative climate were investigated: Organizational Culture and Employee Attitude. The questionnaire consisted of ten assertions written in the form of statements with the possibility of different answers in the form of a five point Likert type scale (5=completely agree, 4=agree, 3=neither agree nor disagree, 2=disagree, 1=completely disagree). This scale allows for a precise determination of the respondent's attitude towards statements.

4. Hypotheses and results

H1: It is possible to assess collaborative climate in SMEs from Serbia using dimensions of CCA instrument.

Principal component analysis of the items that belong to the Collaborative Climate Assessment instrument using Cattel's scree test indicated that the first two components were significant. Varimax orthogonal rotation of the components was used to achieve simpler structure (Table 1).

Table 1 Factor saturation values for items of Collaborative Climate Assessment instrument

Items of Collaborative Climate Assessment instrument	Factor 1: Organizational Culture	Factor 2: Employee Attitude
We are encouraged to say what we think even if it means disagreeing with people we report to.	.803	
We are continuously encouraged to bring new knowledge into the department.	.788	
Open communication is characteristic of the department as a whole.	.745	
Sharing of knowledge is encouraged by the department in action and not only in words.	.704	
The meetings are held on a regular basis to share information.	.649	
Most of my expertise has developed as a result of working together with colleagues in this department.		.809
Combining the knowledge amongst staff has resulted in many new ideas and solutions for the department.		.782
In the department, information sharing has increased my knowledge		.714
Sharing information translates to deeper knowledge in this Department		.696
I learn a lot from other staff in this department		.543
Eigenvalue after rotation	3.087	2.784
% variance	44.71	14.01

Source: Authors' calculations

Reliability of the subscale Organizational Culture evaluated by Cronbach's alpha coefficient is 0.829, which means that the instrument is reliable. Based on the percentage of variance explained for the first major component (44.71%, eigenvalue of the first component is 3.087, (Table 1)) and based on Cattel's scree test, this subscale can be considered one-dimensional, i.e. it has one object of measurement and is homogeneous. Since all items have a significant factor saturation, the validity of this construct is considered satisfactory.

Reliability of the subscale Employee Attitude evaluated by Cronbach's alpha coefficient is 0.805, which means that the instrument is reliable. Based on the percentage of variance explained for the first major component and based on Cattel's scree test, this subscale can be considered one-dimensional, i.e. it has one object of measurement and is homogeneous. Since all items have a significant factor saturation, the validity of this construct is considered satisfactory.

H2: There is statistically significant difference between managers and employees in their assessment of development of certain dimensions of the collaborative climate.

In order to check for statistically significant differences, factor scores were tested using Leven's test for homogeneity of variance and t-test. All results are presented in Table A1. Statistically significant difference between managers and employees was determined in their assessment of the development of dimensions of the collaborative climate. Based on the results the empirical evidence suggests there is highly statistically significant difference in attitudes between managers and employees regarding dimension Organizational Culture ($t = 5.453$, $p < 0.01$). There is statistically significant difference in attitudes between managers and employees regarding dimension Employee attitude ($t = 2.955$, $p < 0.05$).

The result above represented the starting point for deeper analysis of H2 hypothesis with H2.1: There is a statistically significant difference between the CIO and KIO sectors of SMEs in their assessment of development of certain dimensions of the collaborative climate. The same test determined statistically significant difference in the attitudes of respondents depending to which sector of the economy they belonged. Significant

statistical difference in attitudes was determined for Organizational Culture (t = 4.424, p <0.01).

Since there was a noticeable difference in the attitudes between managers and employees, as well as between respondents from CIO and KIO sectors, the authors explored differences in attitudes of managers from CIO and KIO sectors: H2.2: There is statistically significant difference between managers based on the sector they belong to (CIO or KIO) in their assessment of development of certain dimensions of the collaborative climate. Using the aforementioned tests, a statistically significant difference was determined in attitudes of the managers from KIO and CIO regarding the Employee Attitude (t = 1.981, p <0.05). These differences in attitudes are presented in Figure 2a.

2a   2b
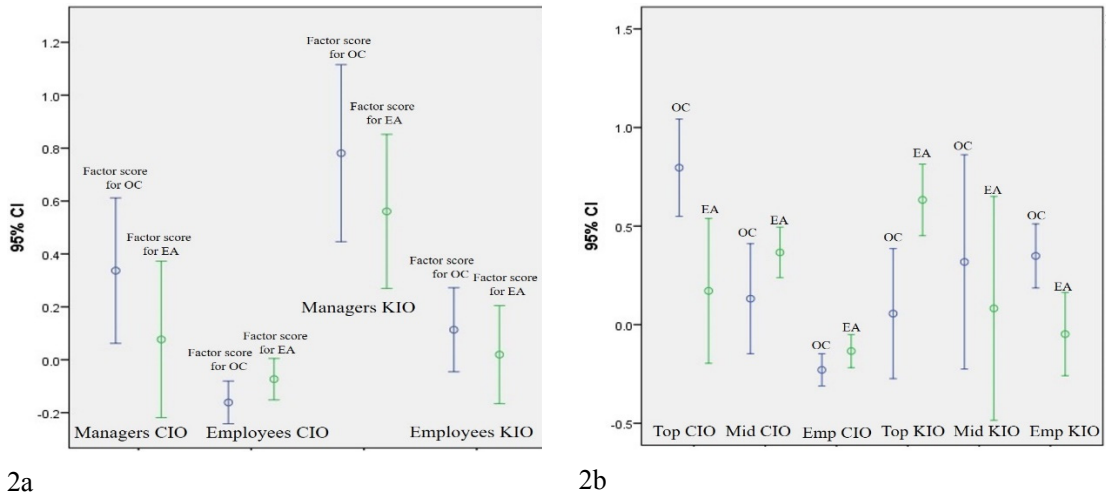
Figure 2 Differences in attitudes of managers (top executives and middle managers) and employees in the observed sectors of SMEs
Source: Authors' calculations

Also, the differences in attitudes between the employees from CIO and KIO sectors were explored, with the hypothesis H2.3: There is a statistically significant difference between employees based on the sector they belong to (CIO or KIO) in their assessment of development of certain dimensions of the collaborative climate. Using the appropriate tests, a highly statistically significant difference was determined in the attitudes of the employees from CIO and KIO regarding Organizational Culture (t = -3.231, p <0.01).

Apart from the mentioned statistical differences, it is important to notice which subgroup of respondents values which dimension more. One can see that respondents from KIO sector value more both the Organizational Culture and the Employee Attitude, while the test indicated statistically significant difference only for Organizational Culture (t = 4.424, p <0.01). From Figure 2, it can be concluded that the managers from CIO and KIO sectors value differently both dimensions, while the test indicated a statistically significant difference for Employee Attitude (t = 1.981, p <0.05). The employees from KIO sector value more both dimensions, while the tests

indicated statistically significant difference for Organizational Culture (t = -3.231, p <0.01).

Looking at Figure 2b, the question arises as to whether there are statistically significant differences between managers and employees in the CIO, or the KIO sectors? The following hypotheses were tested: H2.4: There is statistically significant difference in attitudes between managers and employees from CIO sector of SMEs in their assessment of development of certain dimensions of the collaborative climate. Using the appropriate tests, a highly statistically significant difference was determined between attitudes of managers and employees from CIO regarding Organizational Culture (t = 3.474, p <0.01). Hypothesis H2.5: There is a statistically significant difference in attitudes between managers and employees from KIO sector in their assessment of development of certain dimensions of the collaborative climate. Highly statistically significant differences were determined between attitudes of managers and employees regarding both dimensions: Organizational Culture (t = 3.611, p <0.01) and Employee Attitude (t = 3.135, p <0.01).

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Observed differences in attitudes between managers and employees across sectors, as well as between sectors (CIO and KIO), have led researchers to explore whether there is also difference in attitudes between different levels of management. Do statistically significant differences exist if another level of management is introduced - middle management? The following hypotheses have been formulated: H2.6: There is a statistically significant difference in attitudes between top executives and middle managers from CIO sector in their assessment of development of certain dimensions of collaborative climate. Using the appropriate tests, a highly statistically significant difference was determined between top executives and middle managers regarding Organizational culture (t = 3.516, p <0.01). H2.7: There is a statistically significant difference in attitudes between middle managers and employees from CIO sector in their assessment of development of certain dimensions of collaborative climate Highly statistically significant differences were determined between middle managers and employees regarding both dimensions, Organizational Culture (t = 2.845, p <0.01) and Employee Attitude (t = 4.108, p <0.01).

Differences in attitudes between middle management, top executives and employees were also examined in the KIO sector by testing hypotheses: H2.8: There is a statistically significant difference in attitudes between top executives and middle managers from KIO sector in their assessment of development of certain dimensions of collaborative climate. Statistically significant difference was determined between top executives and middle managers regarding the Employee attitude (t = 2.302, p <0.05). H2.9: There is a statistically significant difference in attitudes between middle managers and employees from KIO sector in their assessment of development of certain dimensions of collaborative climate. There were no statistically significant differences in between middle managers and employees' attitudes. Differences in attitudes between the two levels of management and employees in the observed sectors are presented in Figure 2b.

Evaluation of the various dimensions of the collaborative climate depending on the position in the organization and on SME sector affiliation is presented in figure 2b. Observing the results of the research and separating the management into two levels, the question arises as to whether there is a statistically significant difference in the positions among top executives in the CIO, KIO sector. The question is also whether there is statistically significant difference in the positions of middle management in the CIO, KIO sectors.

The following hypotheses were formulated: H2.10: There is statistically significant difference in attitudes between top executives from CIO and KIO sectors in their assessment of development of certain dimensions of collaborative climate. Statistically significant differences were determined between top executives regarding both dimensions, Organizational Culture (t = 3.536, p <0.01) and Employee Attitude (t = -2.262, p <0.05). H2.11: There is statistically significant difference in attitudes between middle managers from CIO and KIO sectors in their assessment of development of certain dimensions of collaborative climate. There were no statistically significant differences between middle managers from KIO and CIO.

Conclusion

Results of the analysis within hypothesis H2.10 point to the interesting conclusion that top executives from CIO sector assess Organizational Culture significantly higher than top executives from KIO sector. On the other hand, situation is reversed regarding Employee Attitude assessment. Given that top executives define organizational culture in every organization, this indicates that the top executives from CIO sector do not focus on Employee Attitude (Figure 2b). This finding is consistent with the type of capital based economy, in which collaboration does not affect organizational performance, as efficiency and efficacy are defined by technology. On the contrary, in knowledge based economy organizational performance is highly dependent on collaboration. Top executives from KIO assess Employee Attitude significantly higher than top executives from CIO sector.

Analysis of differences in assessment of collaborative climate between managers and employees (hypothesis H2) indicates statistically significant differences regarding both dimensions. Managers assess both dimensions significantly higher than employees (Figure 2a). This finding leads to the conclusion that there is a significant gap in the assessment of collaborative climate between those who create collaborative climate (managers) and those who experience it (employees). These results point to the conclusion that managers need to invest more effort in eliminating identified gap.

Organizational Culture is a dimension of collaborative climate that reflects general perception of organizational attitude towards sharing knowledge. Results obtained for hypotheses H2.1 and H2.3 indicate that there is statistically significant difference in its assessment between employees from KIO and CIO sectors. Employees from KIO sector assess Organizational Culture significantly higher than employees from CIO sector. These results indicate that managers from CIO sector should invest more effort in the development of Organizational Culture in order to accelerate transition towards knowledge economy.

Comparing assessments of both dimensions by middle management and employees from CIO and KIO sectors the interesting conclusion follows. There are statistically significant differences between middle managers and employees from CIO sector in their assessment of both dimensions. On the other hand, not only that there are no such significant differences in KIO sector, but those assessments are very close. This points to the existence of a communication problem in CIO SMEs not only between top executives and employees, but also between middle managers and employees. Communication between middle managers and employees is of the highest importance for implementing any strategy. That suggests that management of SMEs form CIO sector have to solve this problem.

Given that the countries from the South-eastern Europe are experiencing similar transition conditions as SMEs in Serbia, the results obtained in this research could benefit SMEs in the whole region.SM

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Appendix

Table A1 Summary of Hypotheses Testing

Dimension	Levene's Test		t-test for Equality of Means				
	F	Sig	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
H2: Attitudes of managers and employees							
Dimension 1 – Organizational Culture	3.293	.070	5.453	141.005	**.000**	.62073275	.11382471
Dimension 2 – Employee Attitude	.129	.720	2.955	142.913	**.004**	.33504930	.11339200
H2.1: Attitudes of CIO and KIO respondents							
Dimension 1 – Organizational Culture	5.541	.019	4.424	759	**.000**	.354	.080
Dimension 2 – Employee Attitude	10.997	.001	1.399	759	.162	.113	.081
H2.2: Attitudes of managers from CIO and KIO							
Dimension 1 – Organizational Culture	.036	.850	1.620	101.044	.108	.34938004	.21570141
Dimension 2 – Employee Attitude	.089	.767	1.981	111.304	**.050**	.40730198	.20560142
H2.3: Attitudes of employees from CIO and KIO							
Dimension 1 – Organizational Culture	5.570	.019	-3.231	645	**.001**	-.274823	.08505387
Dimension 2 – Employee Attitude	12.469	.000	-1.058	645	.291	-.09283	.08777650
H2.4: Attitudes of managers and employees from CIO							
Dimension 1 – Organizational Culture	2.736	.099	3.474	75.872	**.001**	.49832261	.14344519
Dimension 2 – Employee Attitude	14.755	.000	.979	73.548	.331	.15011815	.15329046
H2.5: Attitudes of managers and employees from KIO							
Dimension 1 – Organizational Culture	.167	.683	3.611	71.819	**.001**	.66739550	.18481275
Dimension 2 – Employee Attitude	1.915	.168	3.135	91.935	**.002**	.54127746	.17266888
H2.6: Attitudes of top executives and middle managers from CIO							
Dimension 1 – Organizational Culture	6.431	.013	3.516	103	**.001**	.6644291	.18897408
Dimension 2 – Employee Attitude	4.682	.033	-1.075	103	.285	-.195048	.18141257
H2.7: Attitudes of top executives and middle managers from KIO							
Dimension 1 – Organizational Culture	1.832	.180	-.838	51.335	.406	-.2619197	.31252817
Dimension 2 – Employee Attitude	9.272	.003	2.302	82	**.024**	.5505191	.23917403
H2.8: Attitudes of middle managers and employees from CIO							
Dimension 1 – Organizational Culture	4.176	.042	2.845	501	**.005**	.36108995	.12690651
Dimension 2 – Employee Attitude	22.418	.000	4.108	501	**.000**	.50037948	.12179929
H2.9: Attitudes of middle managers and employees from KIO							
Dimension 1 – Organizational Culture	19.178	.000	-.144	154	.886	-.030476	.21188262
Dimension 2 – Employee Attitude	.430	.513	.438	38.019	.664	.1302627	.29739173
H2.10: Attitudes of top executives from CIO and KIO							
Dimension 1 – Organizational Culture	18.030	.000	3.536	100	**.001**	.73991972	.20925845
Dimension 2 – Employee Attitude	1.058	.306	-2.265	69.211	**.027**	-.4615682	.20380964
H2.11: Attitudes of middle management from CIO and KIO							
Dimension 1 – Organizational Culture	7.401	.008	-.686	85	.495	-.186429	.27178142
Dimension 2 – Employee Attitude	18.201	.000	1.297	85	.198	.283999	.21898929

Source: Authors.

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Measuring dimensions of service quality

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Abstract
In the modern business environment, service companies face the challenge of continuous improvement of the quality of services. Retail managers must use an adequate system for evaluating the quality of the services they provide within the retail establishment. One of the tools that managers use is SERVQUAL analysis, which consists of five dimensions in the traditional model. The aim of this paper is to highlight the importance and necessity of measuring the dimensions of service quality in retail outlets. The subject of this paper is investigating the attitudes of customers in a retail store in Bosnia and Herzegovina, on the perception and expectations of the quality of services provided to them. The results of the study indicate that the gap between performance and expectations of all dimensions is negative, i.e. that none of the performance according to the dimensions of the SERVQUAL model exceeded respondents' expectations.
Keywords
services, quality, SERVQUAL, satisfaction, retail.

Introduction

Companies facing a modern business environment face many challenges. Constant changes in the macro and microenvironment affect businesses, in all branches of the economy, without exception. Business turbulence is felt by both large and small businesses. Large businesses, of course, find it easier to withstand environmental hazards (risks) than SMEs. Small and medium-sized enterprises are especially vulnerable to the dangers that lurk in their environment, and in the first place are the danger of competition, but also of the loss of clients, i.e. customers.

Regardless of the industry, SMEs need to understand the importance of customers in the value chain they create. Of course, other elements of the microenvironment need to be monitored, but it is customers who are essential to the business success. It is for this reason that businesses seek to attract and retain the required number of profitable customers, which is not an easy task at all. According to Prdić, Kuzman and Damjanović (2019) "in the case of service companies, safeness and quality of provided services, with all following elements, give basic conditions for selling products of high quality."

Manufacturing companies differentiate their offer more easily than service companies and adapt more readily to customer needs, primarily because of the tangibility characteristic. In relation to products, services have certain specificities. According to Veljković (2009), the most significant specificities of services are: intangibility, heterogeneity (variability), simultaneity (inseparability) of production and consumption of the service, and perishability (sustainability) of the service.

These specificities of services also give a different view of the quality of services compared to the quality of tangible products. In order for service companies to be successful, it is necessary to first and foremost adequately manage the front line employees. In the contemporary environment, if we look at the specificity of variability, i.e. absence of standardization, because of overcoming this problem, integration of employees and digitization is very important. The authors Mitea (2018), Vochozka, Kliestik, Kliestikova and Sion (2018), Nica (2018), Hyers and Kovacova (2018) and Bolton, Machová, Kovacova and Valaskova (2018) are concerned in their papers with the automation of work and the collaboration of workers with the solutions offered by modern technology.

Authors Grubor, Đokić and Milićević (2017), Končar and Leković (2016), Nuševa and Marić (2017), and Končar, Grubor and Marić (2019) also

write about the importance of digitalisation in retail.

When it comes to tangible products, most attention is paid to the technical aspect of quality. In the case of services, however, it is slightly different and service companies focus on customer-based quality. According to this concept, quality is what the user says gives him satisfaction.

In relation to the technical, i.e. production observation of quality, the concept of quality as satisfaction is difficult to measure. The author Suuroja (2003) states that service quality and satisfaction are two different concepts and that service quality cannot be equated with customer satisfaction when using the service, but as a result of comparing expectations with the performance provided by the service. In this regard, authors Seth, Deshkmuk, and Vrat (2005) analyse 19 models of service quality, indicating differences in observations of dimensions of service quality by different authors.

However, in addition to the many quality dimension models, there are two widely accepted service quality models, the GAP model and the SERVQUAL model. The GAP model starts from the difference in the perception of the user of the service with the expectations that he had before using the service. The SERVQUAL model uses the GAP model as a basis, and according to Veljković (2009), it represents a "multidimensional scale to compare consumer perceptions with expectations regarding service quality". The following section will provide an overview of recent literature by authors dealing with the SERVQUAL model and its practical application, and then the results of customer satisfaction surveys using the SERVQUAL model in a retail facility operating in the Brcko District of Bosnia and Herzegovina will be presented.

The need for research into the dimensions of the SERVQUAL model is the small number of published papers in this field in Bosnia and Herzegovina. In addition, the topic is significant for practical application in retail stores and can serve retail store managers in planning, implementing, and controlling strategies to improve the quality of services provided. The aim of the paper is to point out the importance of understanding the concept of service quality, its dimensions and how to measure dimensions. The subject of this paper is the analysis of the quality of service, using the SERVQUAL model, on the example of users of services of a service company that performs its business in the territory of Brcko

District. The paper is structured in such a way that it consists of an introduction, literature review, research methodology, research results, discussion and conclusion.

1. Literature review

According to Veljkovic (2009), the SERVQAL model is used to compare consumer perceptions with their expectations. According to this model, there are five dimensions of service quality: reliability, responsibility, security, empathy and tangible elements. Consumer perceptions are measured on a Likert scale from 1 (one) to 7 (seven), where 1 (one) represents the lowest and 7 (seven) the highest degree of agreement with the statement that is offered. The SERVQUAL model involves the creation of a questionnaire that, on one hand, measures the performance of a particular company in the eyes of the service user, and on the other, measures the "ideal" customer expectations of the service they used. This results in discrepancies between performance and expectations, which can then be compared to a "world-class company" or another benchmark in the same business. The SERVQUAL model is a widely accepted model used in the business and final consumer markets, in the for-profit and non-profit sectors, as well as in various service industries. In favour of all of the above are the papers of the authors that we will presented below, which are written on the topic of SERVQUAL model application in retail.

Authors Naik, Gantasala, and Prabhakar (2010) investigate the impact of service quality on retail customer satisfaction. The aim of the paper is to describe the importance of quality of service in retail and to consider which dimensions of service quality are crucial for customer satisfaction. The survey was conducted at retail outlets in India and the conclusion of the survey is that customers have the highest expectations of speed of service execution and payment security, and the lowest expectations of hygiene and ambience as a dimension of quality. When looking at performance, the respondents rated the flow rate at the exit cassettes best, and the lowest performance rating was given to the dimension related to the willingness of staff to respond to customer demands.

Lee-Ross (2008) conducts exploratory research on the contextual stability of SERVQUAL models in three retail clusters in Australia. The results of the research indicate that the five-factor structure of service quality dimensions does not correspond

to the measurement of quality dimensions in retail outlets that were the subject of the survey. The author concludes that evaluation of the quality of services with smaller dimensions would be more appropriate for the mentioned retail stores, and suggests that in the future the existing dimensions of quality should be revised and new instruments for measuring the quality of services should be developed.

To, Tham and Cheung (2013) explore how customers evaluate the quality of service in retail in China. Research has shown that the classic SERVQUAL model does not fit universally for research in all service branches. SERVQUAL questionnaires should be tailored to different service branches and even, in individual cases, to individual service companies.

Sum and Hui (2009) investigate which dimension of sales staff quality has the greatest impact on customer loyalty in Hong Kong. In addition to the aforementioned connection, the authors also examine the relationship of sales staff quality dimensions with customer loyalty, looking at price levels and customer demographic characteristics. The research conclusion is that sales staff empathy is the dimension that most influences customer loyalty, but only when viewed separately from price and customer demographic characteristics. When talking about the sales staff reliability dimension, that dimension is related to customer loyalty and customer demographic characteristics, but not price.

Martinelli and Balboni (2012) state that service quality is crucial in creating retail customer loyalty. In their research in supermarkets in Italy, the authors conclude that, by looking at the dimensions of service quality, physical attributes and responsibility have the greatest impact on customer loyalty. The research findings also confirm the crucial role of perceived service quality with the indirect role of customer satisfaction in generating customer loyalty.

Khare (2013) explores the impact of the hedonistic and utilitarian customer view on service quality perceptions. The subject of research is small retail stores. The results of the survey indicate that customers consider the importance of staff behavior, lending to purchases, and social relationships when evaluating the quality of service provided. Ambient does not play a crucial role in evaluating the quality of service. Assessing quality dimensions and ranking their importance also depends on whether the buyer has hedonistic or utilitarian buying motives.

Evanschitzky, Iyer, and Caemmerer (2008) explore the relationship of customer satisfaction with the dimensions of service quality. In addition to the dimensions offered by SERVQUAL analysis, the authors also examine the impact of alternative dimensions of service quality on customer satisfaction. The research was conducted in Germany and the conclusion of the research is that alternative quality dimensions, which are not conceptualized as in the SERVQAL model, give better results when it comes to linking quality dimensions with satisfaction.

In their research, Clottey, Collier, and Stodnick (2008) focus on the impact of product quality, service quality, and brand image on customer loyalty in the United States. The research results confirm all three research hypotheses that product quality, quality of service and brand image affect customer loyalty, and the authors also provide regression analysis results that can have practical implications for managers if they want to influence customer loyalty.

Nadiri and Tümer (2009) analyse the quality of service and customer behavior in Cyprus. The results of multiple regression analysis suggest that all dimensions of SERVQUAL model quality affect customer behavior. In addition, the authors conclude that repurchase intentions, as well as purchase recommendations given to other potential buyers, are also related to the dimensions of service quality. When looking at the demographic characteristics of the respondents, it is interesting to conclude that higher-than-average customers have lower expectations of the physical attributes of a retail store compared to lower-income customers, and that married customers have higher expectations of ambience than those who they are not married.

Kimani, Kagira, Kendi and Wawire (2012) explore customer perceptions of service dimensions in retail stores in Kenya. The authors seek to determine the difference in the perception of quality between supermarkets and smaller stand-alone shops. The results of the research show that when it comes to smaller standalone shopping activities, customers value the dimensions most in importance as follows: ability to solve problems, ambience and displays, willingness to assist customer by staff, range, hygiene, accuracy of signage, speed of response, individual attention and convenience when shopping. Supermarket shoppers have slightly different priorities when it comes to the dimensions of quality: courtesy, ambience and displays, accurate signage,

individual attention, competitiveness, promise fulfilment, range, fast service, orderliness and accessibility.

Hu, Liu, Su and Huang (2016) investigate differences in perceptions of the dimension of responsibility within the SERVQUAL analysis, if respondents are considered by gender. The survey was conducted at four retail outlets in Taiwan. The results of the study suggest that there is no statistically significant difference in the valuation of the five statements regarding the dimension of responsibility by men and women, although some previous studies confirm this.

Veloso, Ribeiro and Alves (2018) focus on measuring the dimensions of SERVQUAL analysis in the retail sector in Portugal. The authors state that 22 questions, viz. SERVQAL questionnaire statements can be reduced to three dimensions, and can be applied reliably to traditional forms of retail. In addition, the conclusion of this research is that the SERVQUAL model can be seen as a tool for improving the quality of service offered in traditional retail stores and, through increased customer satisfaction and loyalty, lead to better organization and greater profitability.

Karakitsiou and Mavrommati (2018) explore the six dimensions of SERVQUAL in retail outlets located in Greece. The authors used six dimensions in the test over the five standard ones because, based on a review of the relevant literature, they concluded that retail has certain specifics to consider. The results of the survey show that all six dimensions of SERVQUAL need to be worked in the retail outlets surveyed, as none of the performance of the dimensions met the expectations of the service users. On this basis, there is a clear space for improving the quality of services provided by the retail outlets covered by the survey.

Haming, Murdifin, Syaiful and Putra (2019) focus on examining customer perceptions of SERVQUAL analysis dimensions in Indonesia. As the need for research of this kind, the authors cite the reason for the potential improvement in the quality of service provided in retail outlets. The results of the research indicate that the priorities in building quality service to the customers examined are the dimensions of tangibility and empathy, followed by the dimensions of responsibility, reliability and safety, respectively.

The authors Sulistiyowati and Rofik (2018) are concerned with the implementation of SERVQUAL analysis in order to measure the quality of services provided in a retail store. The variables used in the research are the five classic dimensions of SERVQUAL, and based on the results of the research, the authors conclude that the responsibility dimension has a zero gap, which means that the expectations and performance of this dimension are equal, and that the security dimension has the largest negative gap (performance of the dimensions are less than expected).

2. Research methodology

2.1. Aim of the research

The aim of the study was to collect data on the views of customers who visited the selected retailer regarding claims related to the dimensions of the SERVQUAL model. Based on the degree of agreement with the performance and expectation of claims related to the dimensions of service quality, the goal is to determine whether there is a negative or positive gap between claims and expectations, and within which dimensions the SERVQUAL is the smallest, and within which is the largest.

2.2. Subject of research

The subject of the research is the views of customers of the selected hypermarket located in the Brcko District of Bosnia and Herzegovina. In order to investigate these points, on the basis of a random selection of a retail store entered in the register of retail outlets in the Chamber of Commerce of the Brcko District, the manager of the selected retail outlet was contacted. On the basis of discussions with the manager, a permit for exploration was obtained, i.e. reaching potential customers at the retail premises.

2.3. Sample research

A total of 38 (thirty-eight) customers were surveyed. Customers, i.e. the respondents were selected using the systematic sampling method, and the examiners approached every 10th customer who would enter the retail outlet.

2.4. Research procedure

For the purposes of research and to reach the empirical data in this paper, we used the survey method. The respondents were explained that the questionnaire was anonymous. The examiner also briefly explained to the respondents the subject and purpose of the research.

Based on the literature dealing with the analysis and use of the SERVQUAL model, we have compiled a 22 (twenty-two)-question questionnaire according to the methodology provided by the authors of Parasuraman, Zeithaml, and Berry (1988), which is widely accepted and subsequently modified by many authors who write on the topic of service quality dimensions.

Customers were interviewed by the approach of the examiner at the time customers left the retail outlet. Following the consent of the customers to participate in the survey, the examiner orally asked the questions listed in the questionnaire and recorded the answers. The survey lasted one day between 8am and 5pm.

2.5. Statistical data processing

Once the data were collected, data processing was started with the help of the SPSS statistical package. The questionnaire from which the data were collected consisted of 25 (twenty-five) questions. The first three questions concerned the demographics of respondents (gender, age and education). Gender and education are defined as nominal variables and education as a ratio variable. Other questions (22 questions) are related to the SERVQUAL model of service quality dimension research.

These questions are given in the form of statements, and are categorized into SERVQUAL model dimensions (tangible elements, reliability, responsibility, safety and empathy). On the one hand, respondents provided answers about the degree of agreement with statements regarding expectations, and on the other hand, respondents gave answers about the performance of a particular retail item, which is typical of the SERVQUAL model, and a 7 (seven) Likert scale was used to express the degree of agreement with respondents. The respondents expressed their degree of agreement with the statement in such a way that 1 (one) is the lowest and 7 (seven) the highest degree of agreement with the statement.

3. Results of the research

The results of the survey based on the data collected are below. Table 1 shows the demographic characteristics of the sample respondents related to nominal variables (gender and education. Based on the sample of 38 respondents, we can see that there were 17 men (44.7%) and 21 women (55.3%) In terms of education, 10 respondents (26.3%) have completed

a college, master's or doctoral degree, 28 respondents (73.7%) have a university degree, and none of them has only a primary school education.

Table 1 Demographic characteristics of respondents (gender and education)

Demographic characteristics of respondents	Frequency	Percentage	Cumulative percentage
Pol			
Male	17	44,7	44,7
Female	21	55,3	100,0
Total	38	100,0	100,0
Education			
Faculty, Master's, Ph.D.	10	26,3	26,3
High school education	28	73,7	100,0
Primary education	0	0,0	
Total	38	100,0	100,0

Source: The author

Table 2 presents age data of the respondents expressed in years. The average age of the respondents is 38.87 with a standard deviation of 15.80. The minimum value of variable age is 18, the maximum value is 73 years.

Table 2 Age of the sample respondents

Age of respondents	Value
Average value	38,87
Standard deviation	15,80
Minimum	18
Maximum	73

Source: The author

Data on mean values and standard deviation of the degree of agreement with the statements from the SERVQUAL model questionnaire are shown in Table 3. The 22 statements are categorized into five dimensions of service quality: reliability ("Promised service fulfilled", "Customer problems solved", "Service is good 'from the first' ", "Service delivered within the promised time", "Service is delivered without error"), responsibility ("Customers are informed about the delivery time", "Service is performed quickly", "Employees are ready to help the customer ", "Employees are ready to respond to requests "), security ("Employees instill confidence in customers", "Customers feel safe when paying", "Employees are polite", "Employees know how to respond to customers"), empathy ("Customers are given individual attention", "Employees take care of customers", "Customers come first to employees ", "Employees understand customer needs", "Working time is customized for customers"), tangible elements

("Retail is modern", "Retail is visually appealing", "Employees are uniformed and tidy", "Equipment in the facility is adequate for services").

When it comes to performance, the highest median value is the statement "Employees are ready to respond to requests" with a mean of 5.24 and a standard deviation of 1.05. The lowest mean value is shared by the claims "Retail is modern" (mean 4.24 with standard deviation 1.02) and the statement "Equipment in the facility is adequate for services" (mean 4.24 with standard deviation 1.42). Other dimensions of performance have the following mean values and standard deviations: "Promise service fulfilled" (mean 4.63 with standard deviation 0.94), "Customer problems solved" (mean 4.55 with standard deviation 0, 83), "Service is good" from the first "" (mean 4.53 with standard deviation 0.83), "Service delivered within the promised time" (mean 4.58 with standard deviation 0.92), "Service is delivered without error " (mean 4.63 with standard deviation 0.85), "Customers are informed about delivery time" (mean 4.76 with standard deviation 1.17), "Service is performed quickly" (mean 4.95 with standard deviation 1.21), "Employees are ready to help the customer" (mean 5.03 with standard deviation 1.08), "Employees instill confidence in customers" (mean 4.45 with standard deviation 1.62), "Customers feel safe when paying" (mean 4.92 with standard deviation 1.57), "Employees are polite" (mean 4.61 with standard deviation 1.41), "Employees have the knowledge to respond to customers" (mean 4.58 with standard deviation 1.65), "Customers are given individual attention" (mean 4.87 with standard deviation 1.34), "Employees take care of customers" (mean value 4.47 with standard deviation 1.31), "Customers come first to employees" (mean 4.66 with standard deviation 1.32), "Employees understand customer needs" (mean 4.29 with standard deviation 1.51), "Working time is customized for customers" (mean 4.82 with standard deviation 1.49), "Retail is visually appealing" (mean 4.45 with standard deviation 1.13), and "Employees are uniformed and tidy" (mean 4.47 with standard deviation 1.08).

In terms of expectations, the statement "Working time is customized for customers" has the highest mean value (mean 6.74 with a standard deviation of 0.60), while the lowest mean value has the claim "Customers come first to employees" (mean 4.87 with standard deviation 1.17). Other dimension of expectations have the following mean values and standard deviations: "Promised service fulfilled" (mean 6.66 with standard deviation 0.63), "Customer problems solved" (mean 6.50 with standard deviation 0.69), "Service is good 'from the first' " (mean 6.61 with standard deviation 0.59), "Service delivered within the promised time" (mean 6.45 with standard deviation 0.69), "Service is delivered without error "(mean 6.11 with standard deviation 0.80)," Customers are informed about the delivery time "(mean 6.50 with standard deviation 0.51), "Service is performed quickly" (mean 6.53 with standard deviation 0.60), "Employees are ready to help the customer" (mean 6.37 with standard deviation 0.59), "Employees instill confidence in customers" (mean 6.66 with standard deviation 0.58), "Customers feel safe when paying" (mean 6.63 with standard deviation 0,54), "Employees are polite" (mean 6.53 with standard deviation 0.65), "Employees know how to respond to customers "(mean 6.61 with standard deviation 0.55), "Customers are given individual attention" (mean 5.29 with standard deviation 0.93), "Employees take care of customers "(mean value 6.08 with standard deviation 1.22), "Employees understand customer needs" (mean 5.84 with standard deviation 0.79), "Retail is visually appealing" (mean 5.16 with standard deviation 0.79), and "Employees are uniformed and tidy" (mean 6.26 with standard deviant 0.83), "Employees are ready to respond to requests" (mean 6.47 with standard deviation 0.69), "Retail is modern" (mean 4.89 with standard deviation 0.80) and assertion "Facility equipment is adequate for services" (mean 6.66 with a standard deviation of 0.48).

Table 3 Degree of assertion (retailer performance and customer expectations)

The statement	N	Mean (performance)	Standard deviation (performance)	Mean (expectation)	Standard deviation (expectation)
S1	38	4.63	0.94	6.66	0.63
S2	38	4.55	0.83	6.50	0.69
S3	38	4.53	0.83	6.61	0.59
S4	38	4.58	0.92	6.45	0.69
S5	38	4.63	0.85	6.11	0.80
S6	38	4.76	1.17	6.50	0.51
S7	38	4.95	1.21	6.53	0.60
S8	38	5.03	1.08	6.37	0.59
S9	38	5.24	1.05	6.47	0.69
S10	38	4.45	1.62	6.66	0.58
S11	38	4.92	1.57	6.63	0.54
S12	38	4.61	1.41	6.53	0.65
S13	38	4.58	1.65	6.61	0.55
S14	38	4.87	1.34	5.29	0.93
S15	38	4.47	1.31	6.08	1.22

S16	38	4.66	1.32	4.87	1.17
S17	38	4.29	1.51	5.84	0.79
S18	38	4.82	1.49	6.74	0.60
S19	38	4.24	1.02	4.89	0.80
S20	38	4.45	1.13	5.16	0.79
S21	38	4.47	1.08	6.26	0.83
S22	38	4.24	1.42	6.66	0.48

Source: The author

4. Discussion

The research findings in the previous section of the paper point to several facts. If we generally consider all dimensions of the SERVQUAL model, the gap between performance and service expectations is negative across all dimensions. The performance of the services provided by retail outlets is below the expectations of the surveyed service users. The problem in determining the difference between the mean values of the degree of agreement with the performance statements and the expectations in this study is, first of all, the values of the Cronbach's alpha coefficient. Cronbach's alpha values by dimensions (performance) are: reliability (alpha = 0.89), responsibility (alpha = 0.87), security (alpha = 0.90), empathy (alpha = 0.88) and tangible elements (alpha = 0.90). Cronbach's alpha coefficients by dimensions (expectations) are: reliability (alpha = 0.60), responsibility (alpha = 0.88), security (alpha = 0.72), empathy (alpha = 0.15), and tangible elements (alpha = 0.06). Based on the results that can be compared, which results from the application of internal consistency indicators, i.e. Cronbach's alpha coefficient, we can conclude that the following statements are sorted by dimensions of service quality: reliability, accountability and safety. Claims within the empathy dimensions and tangible elements cannot be compared because of the extremely low values of the Cronbach's alpha coefficient, namely: 0.15 and 0.06 respectively. According to this, only data on the difference between performance and expectations for those dimensions that have an acceptable Cronbach's alpha coefficient are shown in Table 4.

Table 4 Difference between performance and expectations

Statement	N	Mean(performance) - Mean(expectation)
The promise of service is fulfilled	38	-2,03
Customer problems are being addressed	38	-1,95
The service is good "from the first"	38	-2,08
The service was delivered on time	38	-1,87
The service is delivered without error	38	-1.47
Customers are notified of the delivery time	38	-1.74
The service is executed quickly	38	-1.58
Employees are ready to help the customer	38	-1.34
Employees are ready to respond to requests	38	-1.24
Employees instill confidence in customers	38	-2,21
Customers feel safe when paying	38	-1,71
The employees are kind	38	-1,92
Employees have the knowledge to respond to customers	38	-2,03

Source: The author

In this way, the biggest difference between performance and expectations is in the statement "Employees instill confidence in customers" (-2.21). The smallest difference between performance and expectations is in the statement "Employees are ready to respond to requests" (-1.24). Other differences in the claims are: "Promised service fulfilled" (-2.03), "Customer problems solved" (-1.95), "Service is good 'from the first' " (-2.08), "Service delivered within the promised time" (-1.87), "Service is delivered without error" (-1.47), "Customers are informed about delivery time" (-1.74), "Service is performed quickly" (-1.58), "Employees are ready to help the customer" (-1.34), "Customers feel safe when paying" (-1.71), "Employees are polite" (-1.92) and "Employees have the knowledge to respond to customers" (-2.03).

Managers of the retail outlet subject to the survey have space for progress in delivering quality, but relatively small deviations from performance, as it is a seven-step Likert scale, suggest that the situation in the retail outlet is not so bad. However, as a prerequisite for satisfaction, it is necessary to take measures to improve the quality of all dimensions of services and thus lead to greater loyalty of service users and greater profitability of the retail outlet.

Conclusion

SMEs are beginning to understand the importance of the customer in delivering value, whether it is tangible products or services. Of course, in addition to customers, one needs to monitor other elements of the microenvironment. In relation to tangible products, services have certain

specificities that make it difficult, among other things, to differentiate them from competitors. However, services must be offered to the market in order to be unique. Due to the above, it is necessary to pay attention to the development and improvement of the dimensions of services. In order to adequately develop the dimensions of services, it is necessary to observe the dimensions of the services through the eyes of customers. This means that models of evaluation of service dimensions need to be developed.

The two generally accepted models are the GAP model and the SERVQUAL model. This paper focuses on the SERVQUAL model in retail. The SERVQUAL model is based on the GAP model, and its essence is to compare consumers' perceptions with their expectations. The premise of the model is five dimensions: tangible elements, reliability, responsibility, security and empathy. The results of the survey show that when looking at performance, the smallest mean value is shared by the claims "Retail is modern" and the statement "Equipment in the facility is adequate for services" and the largest "Employees are ready to respond to requests". Looking at expectations, the statement "Working time is customized for customer" has the highest average value, while the statement "Customers come first to employees" is the lowest.

The Cronbach's alpha coefficient was used to measure the internal consistency of the questionnaire, which showed that the two dimensions within the expectations did not meet the criteria to be taken for further analysis. This suggests that the dimensions need to be modified and adapted to the retail service sector.

There are several limitations to this paper. First, the sample size of 38 subjects is sufficient for statistical processing but not for generalizing conclusions. Secondly, the question of the relevance of using the SERVQUAL model for evaluating the dimensions of service quality is raised because, as in many studies that can be found in the relevant literature, the problem of internal consistency of dimensions as a rating factor arises in this research. This is particularly reflected in the fact that, specifically in this paper, two dimensions of quality are omitted from further analysis of differences between performance and expectations. Third, the research focuses only on retail as one service sector.

One recommendation for future research would be to do a similar survey with a larger sample of both retail outlets and respondents, i.e. customers. In addition, research should be conducted with a modified SERVQUAL model, which would address the issue of internal consistency of the model. It would also be interesting to conduct a survey covering multiple service sectors and to compare the results obtained. SM

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Benchmarking in human resource management in focus of Central and Eastern Europe in the light of CRANET research

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Abstract

In the Central and Eastern European (CEE) countries within the framework of the previous economic system, there were only traces of the features of modern human resource management (HRM). Since the political and economic changes, major transformation in the HRM practice has occurred, resulting in a development of the organizational position, role and practices of HR activity in the Central and Eastern European countries.

The aim of our benchmark study is to compare the HRM practice of the CEE region with the other European countries and with the global HRM trends. The benchmarking study may show the region-specific characteristics of HRM practice in the CEE region. The comparison of specific HR variables (availability of HR departments and HR services, strategic importance of HR functions, budget of training and development, influences of Trade Unions) will be made based on the data of Cranet international research results from 2004 to 2016.

Introduction

Human capital and their skills are the main drivers of economic growth and national competitiveness in the modern economy (Kordić & Milićević, 2018; Radivojević, Kahrović & Krstić 2019), "they introduce changes and innovations, they create additional value and they increase business efficiency, and thus the initiation of future organization performance" (Perić, Gašić, Stojiljković & Nešić, 2018, p. 618). Also, in the era of automation and digitalization, it is important to develop human capital in a firm to make them capable to handle new challenges (Nica, 2018; Stuken & Korzhova, 2019). The working arrangements have been changed a lot (Popescu, 2018) and new knowledge, skills, and abilities are needed, in terms of problem solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence,

judgment and decision-making (Héder, Szabó & Dajnoki, 2018, p. 130).

In Central and Eastern European (CEE) countries within the framework of the previous economic system, there were only traces of the features of modern human resource management (HRM). Since the political and economic changes, major transformation in the HRM practice has occurred, resulting in a development of the organizational position, role and practices of HR activity in the Central and Eastern European countries.

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This paper consists of four parts. In the first part, the authors presented the main features of the HRM practice in the CEE region and the importance of benchmarking studies in this area. In the second part there has been presented the methodology of the research. In the third part the authors presented the main results of the analysis of the data. At the end, there are given some concluding remarks based on the research.

1. Theoretical background

In different regions of the world, in different forms of capitalism (coordinated or free-market capitalism), different HRM approaches and practices have emerged due to the significant differences observed above, which are further diminished by the institutional and cultural characteristics of each country (Armstrong & Taylor, 2017). These features also explain the contextual nature of HRM, which is dependent on environmental conditions. This is why we consider it legitimate to examine the practice of transforming countries separately (Mathias Jackson, Valentine & Meglich, 2017).

In studying the traditional and recent forms of comparative capitalism, four different models are distinguished by different authors:

1. Two traditional forms of different systems of capitalism are as follows. The free market is a large-scale Anglo-Saxon Liberal Market Economies (shareholder capitalism) and Coordinated Market Economies (stakeholder capitalism) (Hall and Soskice 2001; Whitley, 1999; Amable, 2003).
2. The group of Southern and Latin countries is the third group so called Mediterranean or Mixed Market Economies (Hancke, Rhodes & Thatcher, 2007)
3. Emerging Market Economies of Central and Eastern Europe (CEEs) (Amable, 2003; Brewster et al., 2010; Poctowski, 2011; Kazlakauiste et al., 2013).

In the following section, we will only deal with the fourth group of countries mentioned above; some of typical characteristics of HR are summarized below.

From the point of view of human resource management, the management of the Eastern European Country cluster (CEE) as a separate cluster can be explained by the following in the literature. Due to the traditions, the level of economic development of each single country and the different centralization of the previous economic and political system, differences in development can be observed in the HRM practice of the various Central and Eastern European countries (Erutku & Vallee, 1997; Poór 2008).

In these countries within the framework of the previous system, there were only traces of the features of modern HRM (Brewster, Morley & Buciuniene, 2010, Pocztowski, 2011). In most cases, there were some approaches to the science management method. The human resource management function was largely over politicized in the case of "white-collar jobs" (Morley, Poór, Heraty, Alas & Pocztowski, 2016). The key positions in companies were closely monitored by the party and by state bureaucracy. Management was not considered as a profession (Cakrt, 1993) and decisions regarding promotion were not based on performance assessment (Pearce, 1991).

Since the change of regime, major changes in human resource management have taken place. Ownership structure has been transformed in these countries. The dominance of state and cooperative property has ceased, large foreign capital has flown into the region in a form of FDI, as an „external source of accumulation and indisputable precondition of permanent change of economic growth to a higher level" (Cvetanović Despotović & Milovanović, 2018, p. 18). Also, "current globalization process, internationaliza-tion of political, economic and social ties, development of technology, raising environmental awareness, are constantly imposing the need to adapt to a turbulent

environment" (Slavković & Slavković, 2019, p. 116), where HRM is also changing and adapting. It has been a constant problem what HRM practice would be the best. Especially in the case of local subsidiaries of multinational companies, significant changes could be observed. According to Lewis (2005), these companies have redefined the map of the labor market of the former socialist countries in many respects. Thus, among others, they have pulled down equation and introduced the basic salary according to the importance of the jobs. Exceptionally high performances have been rewarded with exceptionally high pay. In addition to technical knowledge, the importance of foreign languages has come into view. However, it is important to emphasize that, apart from key jobs (managers, specialists, etc.), local wage earnings are far below the levels available in the Western European labor market. For average payouts, the differences are 2-3 times (Average, EU; 2018), while these differences are "in the EU Member States ranged from EUR 261 to EUR 1 999 per month in July 2018" (Minimum wage statistics, 2018).

The human resource management practices of organizations operating in the Central and Eastern European region have changed significantly since the change of regime – influencing factors varying from country to country and driven by incentive forces (Morley, 2008). Many of the common features of the forty-year-long socialist era that dominated the management of people's issues in many respects, have still had an impact even after more than two decades of transformation on today's HR practices – many believe, including the authors of this contribution.

Benchmarking is the process of identifying the highest standards of excellence for products, services, or processes, and then making the improvements necessary to reach those standards – commonly called "best practices". Benchmarking is not just competitive analysis or number crunching, nor is it spying, espionage or stealing. It is a process to establish the ground for creative breakthroughs (Greengard, 1995). Benchmarking has become increasingly important, as organizations strive to compete globally by improving quality and reducing costs (Brillinger, 2001).

Benchmarking contributes to an organization's ability to attain a competitive position by monitoring industry best practices and determining measures of productivity. A further benefit is that self-analysis required by benchmarking encourages the identification of more efficient ways of operating. Benchmarking, by monitoring how other organizations function, offers alternatives to an organization's current business practices and, thus, can assist the performance of the organization. However, benchmarking is not without disadvantages. The changes needed to implement benchmarking require a great deal of teamwork, commitment, an objective focus on the issues concerned, and the willingness and ability on the part of the organization, and individuals, to change. It can also be expensive and difficult to implement. Further, the use of the wrong approach to benchmarking can be counter-productive for the organization or organizations involved and can ultimately undermine an organization's benchmarking efforts (Rodwell, Lam & Fastenau, 2000) The complexity of benchmarking the human capital strategies of others due to higher barriers to imitation than those of product innovations has led many organizations to ignore the HR function (Huang, Roy, Ahmed, Heng & Lim, 2002).

Benchmarking HR practices serves a number of purposes. First, it enables a company to calibrate how it is delivering HR practices. By looking at how other organizations are accomplishing tasks and responsibilities, a company can audit itself and identify areas where practices are within or outside a given norm. Second, benchmarking enables a company to learn from others' successes and mistakes. Building a continuous improvement mentality has become an important goal for many organizations in the last decade; benchmarking can open minds and create a climate in which active learning is encouraged. Third, benchmarking can be used as a tool for creating the motivation to change (Glanz & Daily, 1992).

2. Research methodology

This current research is based on the research data of Cranfield Network of International Human Resources Management (Cranet). Cranet was established in 1989, and is now a collaboration of more than 40 universities and business schools, representing different countries from all over the world (Mayrhofer, 1998).

The Cranet Research methodology compared to the beginning (Brewster, Hegewisch & Lockhart, 1991; Brewster, 1994) has not changed significantly until today, but rather expanded and enlarged. The research is based on the Cranet international research questionnaire and contains over 60 questions. The questionnaire, which is used world-wide, comprises seven main sections:

1. The first section investigates the main characteristics of the Human Resource Management (HRM) department of the organizations surveyed;
2. The second examines resourcing practices;
3. The third deals with issues relating to employee development;
4. The fourth surveys the methods used in compensation and benefits practices;
5. The fifth looks for answers to questions of employee relations within the organization and the existence and forms of communication with employees;
6. The sixth features general questions on organizational data;
7. The seventh records personal information on the respondent. (Cranet, 2011)

In this paper, the authors analyze the data of the 2004-2005, 2008-2010 and 2014-2016 survey rounds. In our analysis, we will show country data in the following grouping:

1. Global cluster (Glob): This sample contains all respondents from the Cranet surveys at three different times, a very heterogeneous population. Nearly all continental European countries, Anglo-Saxon respondents from close and far parts of the world, and an increasing number of Asian countries can be found in it.
2. Former Eastern Bloc countries (CEE): This is a breakdown of countries in each country or successor that can be classified as "Old Eastern Bloc" or, in other words, Socialist countries. Six of the eight CEE countries in the Cranet sample are six EU members and one candidate. It is only Russia that is not part of this socio-economic form.
3. Global clustering without the countries of the "Old Eastern Bloc" (non-CCE countries). This group does not include the so-called "Former socialist countries" indicated in the previous subsection.

The number of respondent organizations in the three surveys and their distribution by country group is shown in Table 1.

Table 1 Number of respondent organizations

2004-2005			2008-2010			2014-2016		
Glob	Non CEE	CEE	Glob	Non CEE	CEE	Glob	Non CEE	CEE
7809	698	826	6415	521	120	6800	506	173

100%	89%	11%	100%	81%	19%	100%	74%	26%

Source: Primary research by the authors

The number of respondents representing the Non-CEE region has declined steadily, more and more organizations have joined the survey in the CEE region: the number of participants in the first and last few years has more than doubled.

Even more significant growth can be seen in the case of domestic organizations, where the number of participants in the third survey is nearly five times higher than that of the first respondents. Among the organizations, business and public-sector representatives are equally represented.

Human resources activities, that is, HR work has long been considered as women's occupations in the countries of Central and Eastern Europe. This can also be seen in our sample, in all three study periods. The difference is most prominent in the research period of 2004-2005: in the sample of global and non-CEE countries, the number of male respondents - both in the private and public sectors – is much higher than in the Central- European countries (Poór, Karoliny, Kovács &Illés, 2018).

3. Research results

In the following section, we will analyze the similarities and differences of four different HR characteristics among the variables indicated without the need for completeness as follows:

1. availability of HR departments and HR services,
2. strategic importance of HR functions,
3. budget of training and development,
4. influences of Trade Unions.

The anticipated and experienced strengthening of the HR function and the strategic role, organizational influence, reputation, integration of the HR leader responsible for HR professional aspects at the beginning of the 21st century is a fundamental element of many researches (Guzman, Neelankavil & Sengupta, 2011; Ulrich & Grochowski, 2018).

The results of the analysis on the availability of HR organizations are presented in Table 2. , show that in terms of the global sample (Glob), all respondent organizations have a ratio of at least 80-90% of organizations / institutions with independent HR or HR support.

Table 2 Proportion of availability of HR departments or services (in %)

	2004–2005			2008–2010			2014–2016		
	Glob	Non CEE	CEE	Glob	Non CEE	CEE	Glob	Non CEE	CEE
Private sector	90,8	91,2	87,6	85,2	91,0	63,3	92,8	95,9	84,5
Public sector	89,6	90,1	84,2	80,9	83,7	70,1	84,7	88,9	74,3
All responding organizations	90,5	90,9	87,4	83,7	88,5	65,1	90,7	93,9	81,6

Source: Primary research by the authors

In terms of the global sample (Glob), all respondent organizations have a ratio of at least 80-90% of organizations / institutions with independent HR or HR support. Global values, however, show a definite temporal fluctuation alongside a high level. At the beginning of the millennium, the 90% ratio is just below 84% in the first years of the 2008-2009 crisis, and then in the 3rd round of our research surveys, it rises above 90%. The downturn in the CEE region - and above all in the competitive sector - is remarkably high, reflecting the sensitivity of the HR area to changes in the economic situation of companies in this region.

According to our research, the HR leader (or person in charge of HR) is globally (Glob) at the beginning of the evaluated period (2004-2005) more than half of the respondents, and later more than 60% - represents HR function at the top level of the organizational hierarchy, usually a member of senior management (Nanzin & Hussain, 2016; Trullen Stirpe, Bonache &Valverde, 2016). According to *strategic importance of HR function* in non-CEE countries, we were able to establish stronger, while in the CEE region we were able to identify weaker integration.

In general, it has to be pointed out that the years following the crisis have also brought about changes in corporate training. There is a consensus that in order to achieve organizational success it is important that training should have to be an impact on the performance of the company (Chikán et al., 2011).

The data on the importance of training development (budget of training and development) are presented in Table 3.

Table 3 Proportion of T&D expenditure in annual wage cost (%)

Proportion of T&D expenditure in annual wage cost	2004-2005			2008–2010			2014–2016		
	Glob	Non CEE	CEE	Glob	Non CEE	CEE	Glob	Non CEE	CEE
0%	18,8	1,0	3,2	6,5	3,3	16,5	3,8	3,7	4,2
1-2%	40,4	49,7	48,5	44,6	45,8	40,7	45,6	43,6	51,0
3-5%	25,5	36,1	34,8	27,7	29,5	22,1	30,7	31,5	28,6
6-10%	10,6	9,4	9,5	12,4	12,4	12,5	13,6	13,9	12,9
Above 10%	4,8	3,9	4,0	8,8	9,0	8,2	6,2	7,3	3,4
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: Primary research by the authors

The importance of training has greatly increased in the last 10–12 years globally, and with this, the proportion of labor costs related to the development of labor training has been shifted upwards. There are no major differences in territorial comparisons, and recent survey data show that respondents in non-CEE countries are moving slightly towards higher rates compared to CEE countries in terms of training costs relative to wage costs. At the same time, it is important to emphasize that in the period 2008-2010, the proportion of responding organizations that have lowered their training costs to 0% has been greatly increased in the CEE countries, i.e. no T&D funds have been spent on this (16.5% in 2004). From 3.2% in 2005 to 2005), and it is also interesting to

note that the share of over 10% has just jumped over this period (from 4% to 8.2%). This extreme evolution is probably due to the difference in composition of responding organizations.

Since the marked separation of employee and owner interests (see Carrell & Heavrin, 2014 for details on its formation), it is a natural fact that there are different interests of the owners and employees (László, 2010).Generally speaking, CEE region is in a special situation. The role of trade unions significantly diminished after compulsory trade union membership was abolished in the region (Poór et al, 2017).There are, of course, differences between countries, e.g., the unionization of workers employed by

multinationals is especially low in Eastern Europe (Tóth, 1998).

Due to Cranet research at the global level (Glob), unionization level gradually decreased from an initial 39.2% to 33.5% by 2008-10 and then to 31.7% by 2014-16. Looking at CEE countries, it can be concluded that the level of unionization decreased from 32.3% in the first survey period (2004-2005) to 23.8% in 2014-16. In some CEE countries (i.e. Hungary), we have experienced a much greater decline than the indicated values.

Conclusion

From our non-comprehensive analysis, we could highlight the following important similarities and differences.

It is clear from our analysis that the practice of CEE organizations relying on HR specialists is less characteristic of other regions. The initial lag of our CEE region in this area was maintained for the second century of the century. The proportion of male and female HR employees in the three examined periods also did not change significantly. It can be stated, however, that in the CEE region, this area is a position occupied by female employees. In addition to the many similarities and differences in the strategic importance of HR work, it is important to emphasize that the role of line management is crucial in the CEE region, in other parts of the world.

With respect to other HR characteristics, the direction of change in each region is the decline. These included responses to the weakening of trade union organization and the decline in their influence. This weakening was the largest in the CEE region.

Our studies based on longitudinal and international comparisons therefore show that although the CEE and the domestic HR practices of single CEE countries in the first two decades of the 21st century have brought about a variety of changes, their deviations from different regions of the world, as well as their solutions, prevailed as well. All of them reinforce the opinion of researchers (Brewster et al., 2018) who, on the one hand, deal with the views on the univerzalisation of HR, and on the other hand, emphasize the role of external (institutional and cultural) factors in pointing-out the context-specific nature of HR. **SM**

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Regression analysis of the impact of internal factors on return on assets: a case of meat processing enterprises in Serbia

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Abstract
The aim of this paper is to identify and measure the impact of internal factors on the business success of meat processing enterprises expressed through profitability. Panel analysis was constructed for the sample which includes 24 enterprises in Serbia at the period from 2007 to 2016. The accounting rate of Return on assets (ROA), as a measure of productivity, was in function of the dependent variable, while the size of the enterprise, age, debt ratio, quick ratio, inventory, sale growth and capital turnover ratio were found as independent variables. A regression model was constructed and indicated that most variables had a statistically significant influence on the dependent variable. This kind of results are very important for potential investors. They can help them to better understand impact of internal factors on profitability and make better decisions about investment in this sector.

Introduction

The main goal of every enterprise is long-term business. In order to achieve that, enterprises must realize business activities successfully. Business success is usually measured by profitability. "Critical success factors answer the question about what drives growth, profitability, and success in company. It is important for managers to understand the dynamics of the factors that drive profitability, and growth to take advantage of them to improve their competitive position. Critical success factors as any other strategic model is iterative and dynamic, managers who can use strategic models dynamically, creatively, and competitively will achieve superior performance" (Tadić, Jevtić & Jančev, 2019).

Profitability, as ability to gain earn on investment, is a key prerequisite for the growth and development of a business and the achievement of its core business goal. High profitability is the primary goal of every business, regardless of its size, method of financing, ownership and other internal or external factors that in many ways affect the achievement of this goal.

Besides continuously measuring profitability, management of enterprises must identify which factors have significant influence on profitability. Factors can have significant positive or negative influence on enterprises profitability.

Analyses of profitability and its significant factor provide the profile of enterprises success which can be useful for a wide range of financial statements users.

The aim of this paper is to analyze profitability factors of meat processing enterprises in the Republic of Serbia. The meat processing industry is one of the major industry for providing food safe supply and reducing import dependency.

The research is based on financial statements of meat processing enterprises for a period 2007-2016. The data was collected from the Scoring database (Scoring, 2019).

1. Literature review

Profitability and factors of profitability are investigated by many authors using different methodological approaches.

The profitability of 137 Turkish listed manufacturing enterprises was analysed by Coban (2014). The research was based on the panel data and system-GMM. The results showed that there is a statistically significant positive relation between current profit and current growth.

McDonald (1999) analysed the profitability factors of the Australian manufacturing enterprises for the period 1984-1993. The results indicate that lagged profitability and industry affiliation are the crucial factors of profitability.

The determinants of profitability in food sector in Pakistan was research by multivariate regression analysis (Nousheen & Arshad, 2013) in the period 2002-2006. The results show significant negative relationship between size and profitability. Furthermore, tangibility, growth and food inflation are insignificantly positively related to profitability. Debt to equity ratio has negative insignificant influence on profitability.

Dogan (2013) investigated the profitability factors of 200 companies listed on Istanbul Stock Exchange for the period 2008-2011 by using multiple regression and correlation methods. The result of analysis indicates a positive relation between size indicators and profitability of firms. Control variables as the age of the firms and leverage rate have been found in a negative relation with ROA, but liquidity rate and ROA have been determined to have a positive relation.

Multiple linear regression and the Karl Pearson Correlation Coefficient were used to analyze profitability determinants of agricultural firms listed at the Nairobi Securities Exchange in Kenya (Collins, 2016). The results show that that there is a positive and statistically significant relationship between liquidity, firm size and profitability, whereas there is a significant negative relationship between tangibility and profitability.

The impact of internal factors on profitability of

agricultural sectors of countries of CEE region for the period 2011-2014 was investigate by using a panel data estimation technique (Mijic & Jaksic, 2017). The results show that profitability of agricultural sector in Hungary and Romania is positively related to quick ratio, debt ratio, sales growth and lagged profitability. Companies' size and fixed assets to total assets ratio have negative impact on profitability. Profitability determinants of agricultural sectors in Serbia and Bosnia and Herzegovina are similar. In both countries, profitability of agricultural industry are positively related to the quick ratio, lagged profitability and growth, while in Bosnia and Herzegovina leverage is also significant.

2. Data and methodology

According to Levinthal (1995), the analysis of business performance differences is the basic mission of strategic management.

In this regard, the aim of this paper is to indirectly explain the sources of the above mentioned differences through the identification and measurement of internal factors that influence the success of the business of the company.

The subject of the research was to determine the way in which internal business factors demonstrate the impact on the performance of enterprises measured by productivity.

The regression model has determined the direction of this influence (positive / negative), the strength of effect (lower / higher coefficient) and the statistical significance of the impact.

In accordance with the aim of the research and after a detailed analysis of the research studies in the subject area, the following hypothesis was set up:

H_1: Internal factors, such as size of company, age, debt ratio, quick ratio, inventory, sale growth and capital turnover ratio, have a significant influence on profitability (measured by return on assets) of meat processing enterprises in Serbia.

The original sample consisted of 34 meat processing enterprises, but in order to build a balanced panel model, the final sample covered 24 enterprises that were observed in the period 2007-2016 (10 years). The source of data was the Agency for Business Registers of the Republic of Serbia.

The business success of selected enterprises in survey is measured by its profitability. Return on assets (ROA – Return on Assets) is an often used profitability indicator in analysis and it is more appropriate profitability indicator than Return on

Equity (ROE) because "the return on equity wouldn't provide a good comparison because the small and the negative equity levels of some enterprises would generate distorted indicators of profitability" Vieira (2010).

For these reasons, ROA was selected as the dependent variable in the regression model.

List of other variables used in regression model is given in Table 1.

Table1 List of variables

Variables	Indicator	Explanation
Dependent		
Return on assets (ROA)	Indicates company's ability to generate profit from its assets.	ROA=Net Income Margin x Assets Turnover *Net Income Margin=Net Income/Sales Assets Turnover=Sales/Total Assets*
Explanatory		
Size		
Age		
Debt ratio	Measures the extent of a company's leverage.	Debt ratio= Total debts/ Total Assets
Quick ratio	Company's short-term liquidity indicator	Quick ratio = (current assets – inventories) / current liabilities
Inventory	The most important assets of a business because the turnover of inventory represents one of the primary sources of income generation and following earnings for the company's shareholders.	
Sale growth	Percentage increase (decrease) in sales between two time periods.	Sales Growth = Current Period – Previous Period Sales
Capital turnover ratio	Indicates the efficiency of the organization with which the capital employed is being utilized.	Capital turnover ratio = Sales/ Capital Employed

Source: Authors illustration (based on Chandrapala and Knapkova, 2013; Bhutta and Hassan, 2013; Nuševa, Mijić, Jakšić, 2017).

In order to analyse the influence of internal factors on the profitability of meat production enterprises in Serbia, the following general model was used:

$$y_{it} = \alpha + \beta_{it}x_{it} + u_{it} \qquad (1)$$

where i is a subscript for observation ($i = 1, …,$ N) and t for time ($t = 1, …, T$), x represents the dependent variable, the α tag for the cut, β is k x 1 parameter vector which needs to be evaluated on independent variables, represents 1 x k vector observations on independent variables and represents the mark for a random error (Brooks, 2008).

By incorporating internal variables into the previous equation, we obtain a model that evaluates the impact of internal factors on the profitability of selected enterprises:

$$ROA_{it} = \alpha_{it} + \beta_1 size_{it} + \beta_2 age_{it} + \beta_3 debt\_ratio_{it} + \beta_4 quick\_ratio_{it} + \beta_5 inventory_{it} + \beta_6 sale\_growth_{it} + \beta_7 capital\_turnover\_ratio_{it} + u_{it} \qquad (2)$$

Where i is a subscript for observation ($I = 1,…, 24$) and t for time ($t = 1, …, 10$).

3. Empirical results and discussion

Information about the descriptive parameters for the variables involved in survey are presented in Table 2.

Table 2 Descriptive statistics (240 observations)

Variable	Mean	Minimum	Maximum	Std. Dev.
ROA	0.0686	-0.3179	0.4869	0.0914
Size	5.5015	3.4116	7.1951	0.7950
Age	18.6583	10	46	7.8201
Debt ratio	0.6532	0.1647	0.9713	0.2074
Quick ratio	1.0019	0.13	5.16	0.6769
Inventory	0.1742	0	0.5795	0.1165
Sale growth	0.1861	-0.6281	2.5319	0.3436
Capital turnover ratio	0.3269	0.0162	1.2633	0.2560

Source: The authors

Most theorists agree that a good level of profitability is when a ROA is higher than 10%. As we can see in Table 2, the average ROA on the example of selected meat production and processing enterprises in the observed period of 10 years amounts to 6.86%, which can be considered as a low level of profitability.

Before forming a regression model, it is necessary to examine the correlation between the observed independent variables in order to discover the possible problem of multicolinearity which can cause disorders in estimating the value

of parameters, their significance and the direction of influence on the dependent variable.

Correlation matrix shows coefficients of correlation between pairs of potential independent variables and it is often used method for perceiving the problem of multicolinearity in panel models.

Correlation matrix is displayed in Table 3.

Table 3 Correlation matrix

	ROA	Size	Age	Debt ratio	Quick ratio	Inventory	Sale growth	Capital turnover ratio
ROA	1.0000							
Size	-0.1051	1.0000						
Age	-0.1823	0.4825	1.0000					
Debt ratio	-0.4431	-0.3547	-0.2148	1.0000				
Quick ratio	0.3844	-0.1143	0.0310	-0.4952	1.0000			
Inventory	-0.0193	0.0061	-0.1292	0.1086	-0.3099	1.0000		
Sale growth	0.0919	-0.2216	-0.1335	0.1597	-0.1025	-0.0331	1.0000	
Capital turnover ratio	-0.1582	0.6285	0.4248	-0.3902	-0.0732	-0.1030	-0.2075	1.0000

Source: The authors

All values of correlation coefficients are not at a level that could lead to multicolinearity problems.

In multiple regression analysis, the variance inflation factor (VIF) is often used as indicators of multicolinearity.

Acceptable level of tolerance value is 10 and it is recommended as the maximum level of tolerance. Since all VIF values are less than 10 (see Table 4), it is concluded that there is no multicolinearity between the variables.

Table 4 Colinearity statistics

Variable	VIF
Size	2.011
Age	1.378
Debt ratio	1.898
Quick ratio	1.793
Inventory	1.171
Sale growth	1.089
Capital turnover ratio	1.929

Source: The authors

The question "Which model to choose" is frequently raised when conducting empirical research.

The selection of appropriate model between the pooled OLS and fixed effect is based on the joint significance of differing group means, which is used to test null hypothesis that the pooled OLS model is adequate. A low p-value means that fixed effects model is more appropriate then the pooled OLS model.

Breusch-Pagan test is often used for the selection between the pooled OLS and random effects model. A low p-value means that random effects model is more appropriate then the pooled OLS model.

The selection of appropriate model between random effect and fixed effect is based on the Hausman test which is used to test null hypothesis that the random effect model is adequate and more appropriate then the fixed effect.

Panel model diagnostics is given in Table 5.

Table 5 Panel model diagnostic (assuming a balanced panel with 24 cross-sectional units observed over 10 periods)

Diagnostics	Asymptotic test statistic	p-value	Decision
Joint significance of differing group means:	$F(23, 209) = 0.77911$	0.755	The pooled OLS model is more appropriate than the fixed effects alternative.
Breusch-Pagan test statistic	Chi-square(1) = 0.872518	0.350	The pooled OLS model is more appropriate than the random effects alternative.

Source: The authors

After providing all assumptions, the pooled OLS model is performed. The coefficients estimations are given in Table 6.

Table 6 Pooled OLS model

Variables	Coefficient	Std. Error	t-ratio	p-value
const	0.2798	0.0584	4.783	<0.00001***
Size	-0.0025	0.0084	-0.303	0.76144
Age	**-0.0019**	0.0007	-2.724	0.00692***
Debt ratio	**-0.2413**	0.0316	-7.629	<0.00001***
Quick ratio	**0.0161**	0.0094	1.713	0.08792*
Inventory	0.0264	0.0442	0.598	0.55015
Sale growth	**0.0301**	0.0144	2.086	0.03805**
Capital turnover ratio	**-0.0897**	0.0258	-3.472	0.00062***
R-squared		0.370765	Adjusted R-squared	0.351779
F(7, 232)		19.52881	P-value(F)	0,0000
Log-likelihood		289.5504	Akaike criterion	-563.1007
Schwarz criterion		-535.2556	Hannan-Quinn	-551.8812
rho		-0.052180	Durbin-Watson	1.959131

Source: The authors

Note: *** - level of significance 1%;

** - level of significance 5% ;

* - level of significance 10 %;

Based on the results of the panel analysis (Table 6), it can be concluded that most variables included in model are statistically significance. Variables age (-0.0019), debt ratio (-0.2413) and capital turnover ratio (-0.0897) are statistically significant at the level of significance of 1%,the variable sale growth is statistically significant at the level of significance of 5% and the variable quick ratio (0.0161) is statistically significant at the level of significance of 10%. Other variables have not a statistically significant impact on the dependent variable, which means that the null hypothesis was partially accepted.

Conclusion

"The default of companies is the problem of every economy in the world. Defaults can have various forms, various manifestations and consequences. In particular, the consequences are the engine of research and development of methods and models that help predict the failure in advance. Prediction models are used for an early detection of impending problems in the analysed company" (Valaskova, Kliestik & Kovacova, 2018).

The basic idea of this research was to apply the methodology in the field of panel data analysis to the developed statistical model that includes various internal factors, as determinants of business success of the company. The statistical tests which were applied confirm the assumption that using panel models it is possible to identify

factors that affect the profitability of manufacturing companies in Serbia.

Food processing industry in the Republic of Serbia is very important in order to provide safe food supply. Furthermore, development of food processing industry provide reducing import dependency of food supply. Food processing companies have in average positive profitability. For the period 2007-2016 an average profitability rate is 0.0686 which means that 6.86 percent of assets companies retain as net income.

The research results indicate that quick ratio and sales growth have significant positive impact on profitability of enterprises in food processing industry. Earlier research has shown that if a manufacturing company increases sales of its products, it does not mean that it will increase its profitability, since sales growth can at the same time be accompanied by an increase in company costs. This leads us to the conclusion that sales growth will only affect profitability if cost-cutting is taken into account.

On the other side, age, debt ratio and capital turnover have significant negative impact on return on assets. Furthermore, the results show that size and inventory have insignificant influence on profitability of food processing enterprises.

A number of internal factors affect the success of a business. Identifying these factors can significantly improve a company's business results. It is the responsibility of the company management to recognize the influence of internal and external factors on the business results of the company and make business decisions and take actions for profit accordingly, as the ultimate goal of the business. The results of research can be useful for many internal and external users of financial statements of food processing companies in order to realize an adequate business decisions.**SM**

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Methodology for assessing the integration of the Russian Federation into the world economy: the digital aspect

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Abstract
This study examines the development and functioning of e-business as a tool for integrating the country into the world economy. The article defines the basic concepts of integration, identifies the role of e-business in this process. The method of evaluation of e-business efficiency using the "AAB index" (where: a = attractive, a = artificial, b = business) is proposed, including a system of such Indexes as financial stability, investment attractiveness, level of integration and competitiveness, as well as specialized Indexes of e-business and level of their reference values. The place of the Russian Federation in the world economy has been analysed using existing methods of assessment of integration. On the basis of our proposed method of assessing the integration of the country into the world economy, a comparison of the level of integration of the Russian Federation for 2016-2017 years was made. Directions of increasing the degree of integration of the country into the world economy due to optimization of electronic business are proposed. The analysis was performed based on the data of Russian companies operating in an electronic environment.

Keywords
Integration, world economy, e-business, efficiency of e-business, international company, digital economy, AAB index.

Introduction

Interest in analyzing and studying the peculiarities of integration processes in the world economy in Soviet economic literature arose in the 1950s. The impetus was the intensification of integration processes in Europe. As cooperation developed within the framework of the Council for Mutual Economic Assistance (hereinafter referred to as SMEA), the category "economic integration" marked a developed form of cooperative interaction between its participating States.

Foreign economic thought provides a deeper interpretation of economic integration. Emergence of the early special studies on this subject is dated in the 1930s. During the post-war period and furthermore in modern conditions, consideration of process of integration is considered from positions of theories of firm and institutionalism (Pazizina & Uniyat, 2011). The main approaches to the interpretation of the term "integration" are grouped in Table 1.

Table 1 Overview of basic approaches to the causes and nature of integration within the interim approach

Period	Characte-ristics of theoretical approach	Understanding the reasons and nature of integration	Main representatives of the theoretical approach
1960-1990	Traditio-nal, technolo-gical	The driving force of integration is the desire to save on scale, reduce entrance barriers, etc.	R. Bork, R. Blair, D. Caserman.
	Transa-ction, modern economic	Integration takes place through the formation of significant industrial and production complexes, which deny the commodity and cost side of the exchange of labor results.	R. Coose, O. I. Williamson, D. North, K. Errow, and others from the neo-institutional school, authors of the theory of "transactional economics."
	Vertical integra-tion	Economic linkages that reduce transaction costs are a priority for integration. The advantages of integration include harmonization of goals and interests, risk reduction, cost savings to eliminate asymmetric information.	O.I. Williamson
	Liberal and illiberal (market school)	The integration process is based on exchange and trade. Integration is a condition for ensuring free trade within the integration grouping. Freedom of trade is achieved through tariff and non-tariff regulation of the common trade area.	V. Repke, J. Rueff, R. Aron
	Market-instituti-onal (neolibe-ral school)	The development of economic integration is taking place in a close relationship between public regulation and the market.	B. Balassa Allé, J. Weier
Mid-1960s	Structural	Integration ensures the social development of the participating countries: increases social equality, eliminates imbalances in territorial development, and contributes to the growth of the living standards and quality of life.	G. Murray, A. Marshall, C. Kindleberger, et al.
1970s .	Neo-Keynesian	In order to maximize the benefits of integration and maintain economic sovereignty, coordination of the public policies of the participating countries is necessary.	R. Cooper, B. F. Massel, et al.
	Conduct-ing	The conductor school reduces the integration process to the harmonization of the social and economic policies of the participating countries. Preference was given mainly to factors of social development.	J. Tinbergen, R. Sanwald, I. Stoller
	Functio-nal	At the final stage of the integration process, a functional system is formed, the individual elements of which do not need common political structures. The end product of integration is the formation of a functional system, elements of which can start functioning without a common political add-on.	D. Mitrani, L. Wolf, P. Rainsha
1960-1970.	Neofun-ctionalism	The concept of "community" is a kind of "community or even a system with self-sufficient integration mechanisms," while "integration" is a kind of "ability of a given system to sustain itself as a result of the impact and influence of both internal and external changes."	E. Haas, L. Lindbergh, A. Etzoni

Source: Lizunkov, Policinskaya, Shutova & Trifonov, 2018

At present stage, integration within the EU is characterized by processes of its deepening and expansion. Successive stages of EU enlargement marked the emergence of a number of theoretical models of European integration. The most famous of these are the "strong core" model by V. Stoyble (Kaveshnikov, 2009); the "confederation" model of ex-President F. Mitterrand of France; The "central group" model; J. Delor's model of "concentric circles" (Rosamond, 2000). The Europe of two speeds - Merkel's attempt to save the EU model and many others (Hoffman & Gurkov, 2017). In its majority, modern theoretical models of integration correspond to the global trends of regionalism of the world economy.

Some clarity should be given to the concepts of "regionalism" and "regionalization." Regionalism is a state "integration" policy. In contrast, "regionalization" is a process of "bottom-up integration," expressed mainly through the transnationalization of world and national economies and international economic relations. The process of regionalization includes a sufficiently strong "informal component," which is reflected in the emergence of geographical, social or cultural convergence between countries, civil society structures and new institutions that set the vector for integration processes (Philosophy of the integrations, 2011).

On the basis of foreign studies' analysis, it was found that the main basic features of integration, characterizing its internal content and content, could include:

- Integration (internal form of economic association dominated by power structures);

- Conscious voluntary cooperation, the process of close cooperation generated at the intra-firm level, is more contrary to the market mechanism. This type of integration is based on the harmonization of common development goals and the awareness of the participants in the integration process of the necessity and effectiveness of combining their joint efforts.

- Quality of management plays a crucial role in building successful integration.

As a result, it can be concluded that integration in the economic plane is a particularly complex form of division of labor and social production, which arises and develops in modern conditions of NTR and increasingly active application of intellectual capital.

1. Key indexes of electronic business efficiency

At present, there is practically no common normative methodology in the scientific literature for assessing the level of international economic integration of the national economy into the world economy. To a greater extent, the available methods make it possible to assess the level of development of export potential of the national economy, efficiency of foreign economic activity, to assess the level of migration of its labor force and capital. At the same time, they do not fully reflect the full depth of the problems of international integration of countries into the world economy and do not take into account the impact of the degree of development of e-business on the integration process. The algorithm for assessing the integration of the country into the world economy is shown in Figure 1.
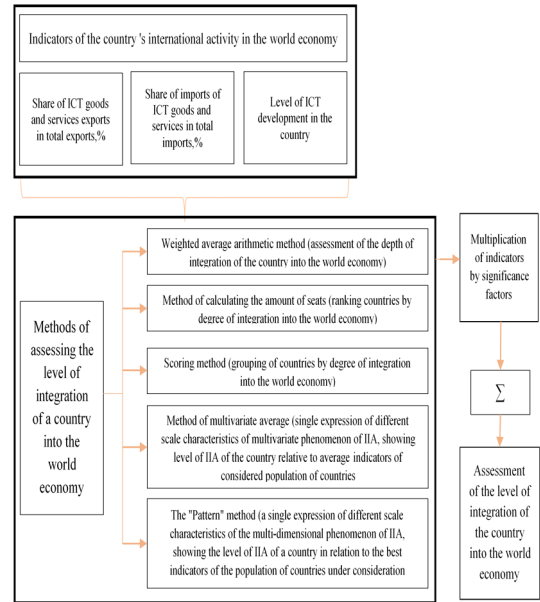
Figure 1 Algorithm for assessing the country's integration into the world economy
Source: compiled by the authors based on materials of Goreckaya & Kosulina, 2011

The methodology we propose takes into account a wider range of integration problems based on the characteristics of the transition period as a result of the change of technological patterns. The evaluation will be carried out through an analysis of the indicator framework based on existing methods. The proposed methodology for assessing a country's integration into the world economy involves the use of a framework of indicators (table 2). The indicators in the table are for the information and communications technology sector (see for examples: Hyers, D., and Kovacova, M., 2018), which is fundamental to e-business because the latter is based on the use of these technologies.

Table 2 Indicators on how to measure a country's integration into the world economy in relation to the ICT sector

Integration indicator	variable	Unit of measure
Level of ICT development in the country (ICT Development Index)	X1	point
Exports of ICT-related goods and services	X2	% of total exports of goods and services
Imports of ICT-related goods	X3	% of total imports of goods and services

Source: The authors

The classification characteristics of a country's integration into the world economy were selected by the economic degree of integration of ICT into the world economy. Table 3 provides an analysis

of the countries on which their integration into the world economy will be assessed. The countries selected for analysis are the leaders of the e-business market in the level of revenue generated by e-business and the level of readiness of these countries for the information economy is highest.

On the basis of the obtained data, we will assess the level of integration of the Russian Federation into the world economy in terms of the ICT sector, which is fundamental for e-business.

Table 3 Data for calculation of the level of integration of countries into the world economy, 2017

Country	ICT Development Index, X1 (Information Society Report 2017)	Share of ICT goods and services in total exports, X2,% (Official website of the World Bank)	Share of information and communication technology products in total imports, X3 (Official website of the World Bank)
Iceland	8.98	2.757	3.484
Korea, Rep.	8.85	22.071	11.818
Switzerland	8.74	3.857	2.816
Denmark	8.71	4.946	4.561
United Kingdom	8.65	5.66	5.764
Netherlands	8.49	10.69	10.28
Luxembourg	8.47	3.588	1.006
Norway	8.47	2.369	4.032
Japan	8.43	7.145	10.012
Sweden	8.41	10.128	6.356
Germany	8.39	6.199	6.733
New Zealand	8.33	1.807	5.688
Australia	8.24	1.813	7.288
France	8.24	4.839	4.634
United States	8.18	8.063	11.608
Estonia	8.14	9.697	7.105
Singapore	8.05	24.343	17.562
Austria	8.02	5.371	3.858
Ireland	8.02	24.138	2.429
Finland	7.88	9.929	4.793
Israel	7.88	25.517	6.301
Spain	7.79	3.815	3.964
Canada	7.77	3.15	5.826
Cyprus	7.77	15.816	1.889
Belarus	7.55	4.536	2.839
Slovenia	7.38	2.973	3.3
Latvia	7.26	10.364	7.847
Croatia	7.24	3.776	4.191
Greece	7.23	2.879	3.275
Lithuania	7.19	4.504	4.832
Czech Republic	7.16	13.443	13.195
Uruguay	7.16	2.481	5.695
Portugal	7.13	3.767	4.647
Russian Federation	7.07	1.629	6.705
Slovak Republic	7.06	16.176	13.396
Italy	7.04	3.05	3.935
Hungary	6.93	10.529	10.486
Poland	6.89	7.729	7.742
Bulgaria	6.86	5.065	4.193
Argentina	6.79	2.75	6.256
Kazakhstan	6.79	0.324	4.395
Brunei Darussalam	6.75	0.165	2.337
Serbia	6.61	5.491	2.851
Chile	6.57	0.761	7.025
Romania	6.48	7.262	6.016
Malaysia	6.38	27.084	19.913
China	5.60	25.805	17.872
Total for selected countries	358.02	380.251	312.750
Average for selected countries	7.62	8.090	6.654

Source: Measuring the Information Society Report 2017; Official website of the World Bank

The data in Table 3 makes it possible to conclude that the level of participation of Russia in foreign economic activity is at a very low level, relative to the represented countries.

The assessment of the degree of integration of the Russian economy into the global economy was carried out on the basis of the formula of arithmetic weighted average.

The Index of the degree of integration of the national economy (Ij) is based on a number of private Indexes (formula 1).

$$I_j = \frac{\sum_{i=1}^{n} a_i x_{ij}}{\sum_{i=1}^{n} a_i}$$

I_j – the index of the degree of integration of the j country into the global economy;

a_i - the weight value of the i Index;

x_{ij} is the point score of the i Index for the j country;

$I = 1, 2,..., n$ is the number of Indexes of foreign economic activity used in the assessment;

$J = 1, 2,..., m$ is the number of countries participating in the evaluation.

For example, the valuation Indexes can be expressed as X1, X2, X3,... Xn.

The point evaluation of FTA Indexes and their weight values are determined either by expert or calculated methods. The weighting value varies between [0; 1]. Their sum within the individual Index group is equal to one. By default, according to Laplace's rule, the weighting value is 1/n. Next, the quantity is multiplied by the weight of the Index, which is the contribution of a single Index to the overall integration Index.

We will calculate the degree of integration of the Russian Federation in the global economy. Quantitative evaluation of Indexes is estimated on the basis of the number of countries: 1 - the worst, 47 - the best. The weighting value is the same for all Indexes and is 0.33 (Table 4).

Table 4 Calculation of the level of integration of Russia into the world economy using the method of arithmetic weighted average

Index	Weight, a_i	Estimate, x_{ij}	Value, $a_i x_{ij}$
X1	1/3	14	4 2/3
X2	1/3	4	1 1/3
X3	1/3	31	10 1/3
Total			16 1/3

Source: The authors

Potentially, the Index of the state of integration of the country into the world economy can reach the maximum value of 47 points, the degree of integration of Russia into the world economy is 16.33 points. Thus, the calculations show that Russia is not sufficiently integrated into the world economy, it is necessary to increase the efficiency of the ICT sector, which will have a positive impact on electronic business (Kostin, 2018).

Similarly to the result of calculations using the weighted average method, calculations can be performed using the scoring method using the best value. The three-point rating system is applied in the table 5: 3 points - high level of integration into the world economy of the country (96 - 141 cl.); 2 points - average (50 - 95 cl.); 1 point - low (3-49 pp.).

Table 5 Calculation of the assessment of the level of integration of the country into the world economy using the methods of sum of seats and points

Country	Index of development of ICT, ICT Development Index, X1	Share of goods and services ICT in total exports, X2, %	Share of goods of ICT in the general import, X3, %	Sum of points	Rank	Point
Brunei Darussalam	6	1	3	10	47	1
Kazakhstan	7	2	17	26	46	1
Italy	12	13	12	37	45	1
Greece	19	11	8	38	44	1
Serbia	5	26	7	38	43	1
Chile	4	3	33	40	42	1
Slovenia	22	12	9	43	41	1
Argentina	8	9	28	45	40	1
Uruguay	16	8	24	48	39	1
Bulgaria	9	24	16	49	38	1
Russian Federation	14	4	31	49	37	1
Belarus	23	21	6	50	36	2
Portugal	15	16	20	51	35	2
Croatia	20	17	15	52	34	2
Luxembourg	40	15	1	56	33	2
Spain	26	18	13	57	32	2
Lithuania	18	20	22	60	31	2
Romania	3	30	27	60	30	2
Norway	41	7	14	62	29	2
New Zealand	36	5	23	64	28	2
Canada	25	14	26	65	27	2
Austria	30	25	11	66	26	2
Cyprus	24	40	2	66	25	2
Iceland	47	10	10	67	24	2
Switzerland	45	19	5	69	23	2
France	34	22	19	75	22	2
Australia	35	6	35	76	21	2
Ireland	29	43	4	76	20	2
Poland	10	31	36	77	19	2
Finland	27	34	21	82	18	2
Denmark	44	23	18	85	17	2
Hungary	11	37	40	88	16	2
China	1	46	46	93	15	2
Latvia	21	36	37	94	14	2
United Kingdom	43	27	25	95	13	2
Malaysia	2	47	47	96	12	3
Germany	37	28	32	97	11	3
Slovak Republic	13	41	44	98	10	3
Czech Republic	17	39	43	99	9	3
Estonia	32	33	34	99	8	3
Israel	28	45	29	102	7	3
Sweden	38	35	30	103	6	3
Japan	39	29	38	106	5	3
United States	33	32	41	106	4	3
Netherlands	42	38	39	119	3	3
Singapore	31	44	45	120	2	3
Korea, Rep.	46	42	42	130	1	3

Source: The authors

The method of the sum of seats and the method of ballroom assessment allow to determine the degree of integration of a country, based on the level of development of the economy of that country, to identify problems in the process of integration. However, the disadvantage of these methods is that the difference between each pair of neighboring countries in the ranking is always constant. Based on the data presented in Table 5, it is recorded that the Russian Federation is the leader of the group of countries with low level of integration through ICT; from the entry into the group of countries with medium level of integration it lacks 1 point. Moving up one position

on at least one Index will provide the Russian Federation with entry into the group of countries with medium level of integration. Values of all considered Indexes by the method of multivariate average are given in Table 6.

Table 6 Calculation of the level of integration of Russia into the world economy using the method of multidimensional average

Country	$\dfrac{x_{1j}}{x_{1cp}}$	$\dfrac{x_{2j}}{x_{2cp}}$	$\dfrac{x_{3j}}{x_{3cp}}$	$\sum \dfrac{x_{Ij}}{x_{icp}}$	I_j	Rank
Malaysia	0.838	3.348	2.993	7.178	2.393	47
Singapore	1.057	3.009	2.639	6.705	2.235	46
China	0.735	3.19	2.686	6.611	2.204	45
Korea, Rep.	1.162	2.728	1.776	5.666	1.889	44
Israel	1.034	3.154	0.947	5.135	1.712	43
Slovak Republic	0.927	1.999	2.013	4.939	1.646	42
Czech Republic	0.94	1.662	1.983	4.584	1.528	41
Ireland	1.053	2.984	0.365	4.401	1.467	40
Netherlands	1.115	1.321	1.545	3.981	1.327	39
United States	1.074	0.997	1.744	3.815	1.272	38
Hungary	0.91	1.301	1.576	3.787	1.262	37
Japan	1.107	0.883	1.505	3.494	1.165	36
Latvia	0.953	1.281	1.179	3.413	1.138	35
Estonia	1.069	1.199	1.068	3.335	1.112	34
Sweden	1.104	1.252	0.955	3.311	1.104	33
Cyprus	1.02	1.955	0.284	3.259	1.086	32
Poland	0.905	0.955	1.163	3.023	1.008	31
Finland	1.034	1.227	0.72	2.982	0.994	30
Germany	1.101	0.766	1.012	2.879	0.96	29
United Kingdom	1.136	0.7	0.866	2.701	0.9	28
Romania	0.851	0.898	0.904	2.652	0.884	27
Denmark	1.143	0.611	0.685	2.44	0.813	26
Australia	1.082	0.224	1.095	2.401	0.8	25
France	1.082	0.598	0.696	2.376	0.792	24
Austria	1.053	0.664	0.58	2.296	0.765	23
Canada	1.02	0.389	0.876	2.285	0.762	22
Lithuania	0.944	0.557	0.726	2.227	0.742	21
Argentina	0.891	0.34	0.94	2.171	0.724	20
New Zealand	1.094	0.223	0.855	2.172	0.724	19
Bulgaria	0.901	0.626	0.63	2.157	0.719	18
Russian Federation	0.928	0.201	1.008	2.137	0.712	17
Uruguay	0.94	0.307	0.856	2.102	0.701	16
Portugal	0.936	0.466	0.698	2.1	0.7	15
Spain	1.023	0.472	0.596	2.09	0.697	14
Croatia	0.95	0.467	0.63	2.047	0.682	13
Switzerland	1.147	0.477	0.423	2.047	0.682	12
Iceland	1.179	0.341	0.524	2.043	0.681	11
Chile	0.862	0.094	1.056	2.012	0.671	10
Norway	1.112	0.293	0.606	2.011	0.67	9
Belarus	0.991	0.561	0.427	1.978	0.659	8
Serbia	0.868	0.679	0.428	1.975	0.658	7
Italy	0.924	0.377	0.591	1.893	0.631	6
Slovenia	0.969	0.367	0.496	1.832	0.611	5
Greece	0.949	0.356	0.492	1.797	0.599	4
Luxembourg	1.112	0.443	0.151	1.707	0.569	3
Kazakhstan	0.891	0.04	0.66	1.592	0.531	2
Brunei Darussalam	0.886	0.02	0.351	1.258	0.419	1

Source: The authors

Table 6 shows that Malaysia (47 points) and Singapore (46 points) have the highest levels of integration. Russia ranks 31st in terms of integration into the world economy among the selected countries.

The Pattern method uses the best values rather than the national averages (Table 7).

Table 7 Calculation of the level of integration of Russia into the world economy using the pattern method

Country	$\dfrac{x_{1j}}{x_{1max}}$	$\dfrac{x_{2j}}{x_{2max}}$	$\dfrac{x_{3j}}{x_{3max}}$	$\sum \dfrac{x_{Ij}}{x_{imax}}$	I_j	Rank
Malaysia	0.71	1	1	2.71	0.903	47
Singapore	0.896	0.899	0.882	2.677	0.892	46
China	0.624	0.953	0.898	2.474	0.825	45
Korea, Rep.	0.986	0.815	0.593	2.394	0.798	44
Israel	0.878	0.942	0.316	2.136	0.712	43
Slovak Republic	0.786	0.597	0.673	2.056	0.685	42
Czech Republic	0.797	0.496	0.663	1.956	0.652	41
Ireland	0.893	0.891	0.122	1.906	0.635	40
Netherlands	0.945	0.395	0.516	1.856	0.619	39
United States	0.911	0.298	0.583	1.792	0.597	38
Japan	0.939	0.264	0.503	1.705	0.568	37
Hungary	0.772	0.389	0.527	1.687	0.562	36
Sweden	0.937	0.374	0.319	1.63	0.543	35
Estonia	0.906	0.358	0.357	1.621	0.54	34
Latvia	0.808	0.383	0.394	1.585	0.528	33
Cyprus	0.865	0.584	0.095	1.544	0.515	32
Germany	0.934	0.229	0.338	1.501	0.5	31
Finland	0.878	0.367	0.241	1.485	0.495	30
United Kingdom	0.963	0.209	0.289	1.462	0.487	29
Poland	0.767	0.285	0.389	1.441	0.48	28
Denmark	0.97	0.183	0.229	1.382	0.461	27
Australia	0.918	0.067	0.366	1.351	0.45	26
France	0.918	0.179	0.233	1.329	0.443	25
Romania	0.722	0.268	0.302	1.292	0.431	24

Austria	0.893	0.198	0.194	1.285	0.428	23
New Zealand	0.928	0.067	0.286	1.28	0.427	22
Iceland	1	0.102	0.175	1.277	0.426	21
Canada	0.865	0.116	0.293	1.274	0.425	20
Switzerland	0.973	0.142	0.141	1.257	0.419	19
Norway	0.943	0.087	0.202	1.233	0.411	18
Lithuania	0.801	0.166	0.243	1.21	0.403	17
Spain	0.867	0.141	0.199	1.207	0.402	16
Russian Federation	0.787	0.06	0.337	1.184	0.395	15
Uruguay	0.797	0.092	0.286	1.175	0.392	14
Argentina	0.756	0.102	0.314	1.172	0.391	13
Portugal	0.794	0.139	0.233	1.166	0.389	12
Bulgaria	0.764	0.187	0.211	1.161	0.387	11
Croatia	0.806	0.139	0.21	1.156	0.385	10
Belarus	0.841	0.167	0.143	1.151	0.384	9
Luxembourg	0.943	0.132	0.051	1.126	0.375	8
Chile	0.732	0.028	0.353	1.113	0.371	7
Slovenia	0.822	0.11	0.166	1.097	0.366	6
Italy	0.784	0.113	0.198	1.094	0.365	5
Serbia	0.736	0.203	0.143	1.082	0.361	4
Greece	0.805	0.106	0.164	1.076	0.359	3
Kazakhstan	0.756	0.012	0.221	0.989	0.33	2
Brunei Darussalam	0.752	0.006	0.117	0.875	0.292	1

Source: The authors

The leaders in Table 7 are Malaysia (47 points) and Singapore (46 points). Russia also ranks 33rd among selected countries when assessed using other methods. According to the pattern method, the level of integration of Russia is slightly lower than in calculations using the multidimensional average method. This is due to the fact that in the latter case it uses not the average level, but the maximum Index among the countries selected for analysis, and the dynamics of imports of goods and services related to ICT in Russia is higher (the Index is 6.7% of the total volume of imports of goods and services).

Table 8 provides a summary table of Russia's integration level by selected methods.

Table 8 Summary table of assessment of the level of integration of Russia into the world economy

Method	Index	Minimum Index	Maximum Index	Average
Method of the arithmetic average	16,33	1	47	23,5
Method of sum of points and scores	1	1	3	2
Method of multidimensional average	0,712	0,419	2,393	1
Method of patterns	0,395	0,292	0,903	0,494

Source: The authors

Thus, it can be noted that Russia's level of integration is not high enough. This determines the relevance of developing measures to increase Russia's integration (and competitiveness as well, according to Miller & Miller, 2019) into the world economy.

2. Improving the efficiency of e-business as a way to integrate Russia into the world economy

Taking into account the identified trends and factors of integration of the Russian Federation into the modern international financial and economic environment, we shall propose a means to optimize electronic business through a progressive tool - neural network technologies. An example of an implementation algorithm is proposed for the service sector, namely enterprises engaged in activities on implementation of services in an electronic environment, however, it can be implemented in the trade sphere (for example, retail trade).

The service sector is one of the most promising and rapidly developing industries in most economies at the present stage of development of the world community. It is under the influence of various factors, including rapid change of economic conditions, improvement of quality of provided services, constant replenishment of the market by new participants, including foreign competitors. These changes have a significant impact on the efficiency of the work of, among other things, Russian enterprises representing the service sector. At present, the tools and technologies of only the traditional management apparatus can no longer ensure the successful functioning of companies representing this sphere (Kostin, 2016).

The intensity of the use of modern information and communication technologies is one of the priority conditions for the sustainable formation of competitive advantages (Kostin & Berezovskaya, 2017). Increasing competitiveness in almost any industry, including services, is possible through the use of automated management systems and systems related to data storage and intelligent processing. Neural networks are now widespread (Kostin & Berezovskaya, 2019).

Using the example of implementation of revenue-management at enterprises operating in the electronic environment, the algorithm of implementation of neural network technology is proposed (Picture 2).

Revenue-management is a set of measures

carried out daily to manage inventory and effective sale of goods/services. Based on the obtained data, reports are prepared, which provide an opportunity to obtain a complete picture of the current state of the market, the position of competitors, hence allowing to adjust the sales strategy. In other words, revenue management is a pricing policy based on the analysis of consumer demand in a certain period of time. It is aimed at ensuring high profitability of the enterprise.

Let us take a closer look at the stages of demand detection. The algorithm allows to obtain data on consumers: on the basis of surveys and tests in social networks the level of consumer interest in various services of the enterprise is analyzed. Structuring takes place according to the services offered by the enterprise and according to personal data (age, sex, nationality, place of residence, education and contact information - data that could be obtained from the profiles of respondents). Based on the data obtained, the number of respondents of a certain category who prefer a particular service of the enterprise is calculated. Accordingly, a certain service of the enterprise is offered to its category of consumers, more of whom chose this service in surveys and tests.
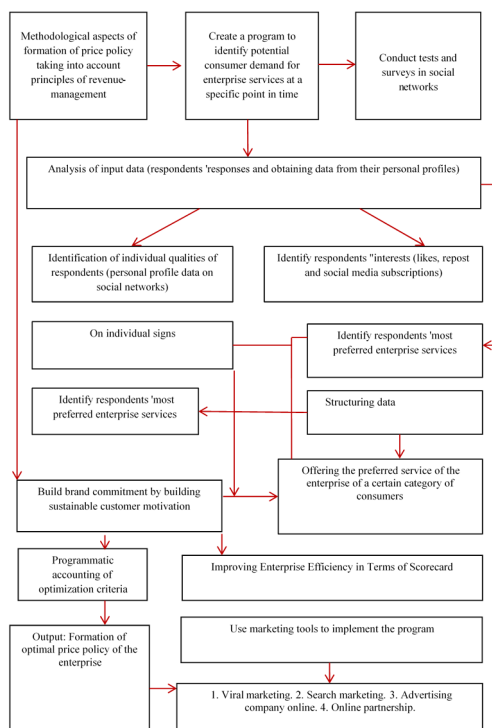
Figure 2 Algorithm of consumer demand estimation based on application of neural network technologies
Source: The authors

Based on the data obtained in the program, it is possible to form a proposal that is individual for each customer or potential consumer. Two options for using the obtained data will be used: 1) development of a site - a landing page for each consumer; 2) advertising of goods/services of the company in public Internet access. Consider both options:

1) The term "lending-page" is formed from the English phrase of "landing page", in translation meaning just the landing, landing (grounding) page. Lendings are created taking into account the psychology of visitors. They must cling and not release them until the very moment of purchase (or registration).

Depending on the goals pursued, it is possible to divide landing pages (lendings) into several types (Figure 3).
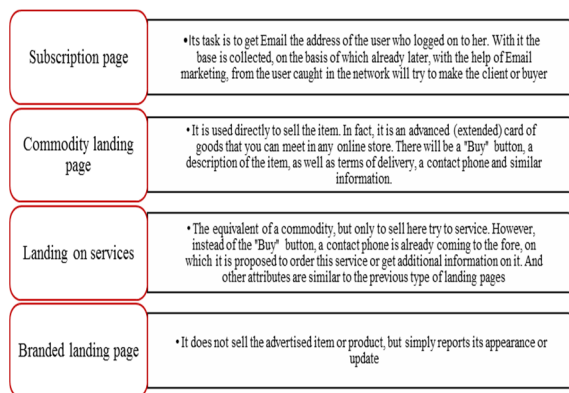
Figure 3 Types of lending pages
Source: The authors

On the basis of structured groups of users, the program will allow to create a lending page, fully adapted to interests at a certain point in time of the potential client individually. The number of pages usually reaches 6-8 pieces, that is, structuring customers will include 6-8 categories of consumers.

2) As in the previous version, the algorithm on which the activity is based can offer the consumer a certain product/service, but not on the page of the company specially created, but through advertising.

The proposed algorithm was tested in 5 Russian companies that are representatives of electronic business. These include: LLC "Infinity Concert," LLC "Eclectica," LLC "M-Advertising" LLC "M-Group," IE "Balchugov." On the basis of the introduction of efficiency technology we have previously proposed, relevant data have been obtained showing the improvement of efficiency of companies. For calculations, relevant data was used for those areas of activity that could be

attributed to the electronic sphere. Data cannot be characterized as aggregate.

Table 9 Evaluation of efficiency of implementation of the proposed revenue-management algorithm with elements of lending promotion in domestic companies, 2016 (before implementation); 2017. (After implementation)

Index	Companies									
	Before					Later				
	LLC "Eclektika"	LLC "M-Group"	IE "Balchugov"	LLC "M-Advertising"	LLC "Infinit Concert"	LLC "Eclektika"	LLC "M-Group"	IE "Balchugov"	LLC "M-Advertising"	LLC "Infinit Concert"
Return on assets %	4,81	6,08	5,11	15,09	10,68	4,97	6,99	8,67	16,98	13,87
Return on sales %	2,07	3,87	2,69	17,98	9,68	5,49	5,08	4,42	17,05	11,25
Absolute liqu-idity,%	0,73	0,16	0,06	2,37	2,02	0,79	0,74	0,32	1,31	1,07

Source: The authors

Based on the obtained results (Table 9), it can be noted that efficiency after implementation increases (for example, return on sales increased in all 5 enterprises on average by 54.36%). However, we believe that the assessment is not enough complete. Given that modern performance measurement methods do not cover specific e-business performance indicators such as conversion, customer value, time spent using the e-platform, on which the company operates, and a number of others. Hence the e-business performance evaluation method has been developed.

3. E-business performance assessment method as part of the assessment of the country's integration into the world economy

The need for objective analysis of the efficiency of the e-business enterprise is due not only to the degree of perspective of investments in the transformation of its activities from the traditional sector (see for example: Grubor, A., Milovanov O.; Nica, E., 2018) to the digital sector, but also to the dynamism of economic development itself in the neuro-network era (see for example: Sudarević T., Marić D., 2018; Popescu, G. H., 2018). Electronic principles of operation of the e-business enterprise differ from traditional ones and dictate the need to develop methods of evaluation of indicators characterizing its financial condition, level of investment attractiveness and competitiveness taking into account the specifics of operation of electronic platforms. The developed system of indicators in the future can serve as a basis for the formation of a strategy for assessing the efficiency of the e-business enterprise on the basis of the proposed algorithm for assessing the efficiency of e-business (Index AAB, where A - attractive, A - artistic, B - business (hereinafter - AAB index).

The following groups of indicators will be included in the indicator framework of the AAB index:

1. Indicators of investment attractiveness assessment;

2. Indicators of assessment of financial stability of the enterprise;

3. Specialized indicators of evaluation of e-business development;

4. Indicators of competitiveness and integration.
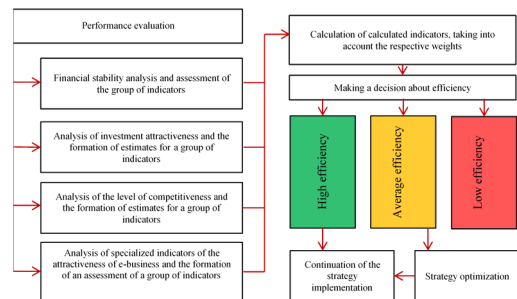
The methodology we propose is shown in Figure 4.

Figure 4 The stages of determining the effectiveness of e-business
Source: The authors based on Kostin, 2015

We have developed the program "AAB", which allows to automate the conduct of the calculation of the effectiveness of electronic business (program code written in the programming language Golang). Excerpt from program code:

```
«Package main
import (
"aab/handlers"
"fmt"
"strconv"
"time"
)
func main() {
handlers.Init()
currentYear, err := strconv.Atoi(time.Now().Format("2006"))
startYear := currentYear - handlers.Period
if err != nil {
fmt.Println(err.Error())
}
for year := startYear; year < currentYear; year++ {
fmt.Println("Заполняем данные для " + strconv.Itoa(year) +
```

```
" года.")
handlers.InsertedData[year]                                =
handlers.ParseDataForYear(handlers.InsertedData[year])
}
handlers.CalcData()
handlers.ShowDataTable()
handlers.ShowGrowthRateTable()
handlers.ShowGradeTable()
handlers.CalcAAB()
}»
```

Based on the analysis, it can be noted that with the help of the AAB index, it becomes possible to determine the company's position on the international market for goods and services sold in the electronic environment, identify its level of financial sustainability and investment attractiveness, as well as assess the level of effectiveness of the e-business strategy. Considering that the "AAB Index" allows to evaluate the above-mentioned categories, it becomes an optimal tool for use in international companies operating in the market of goods and services sold in the electronic environment.

4. Development of the country's integration into the world economy

Taking into account that the level of integration of the country depends on the efficiency of the companies of that country, it is proposed to supplement the methodology of assessing the level of integration of the country into the world economy with an indicator of the efficiency of companies that are representatives of e-business. The updated algorithm for assessing the country's integration into the world economy is shown in Figure 5.
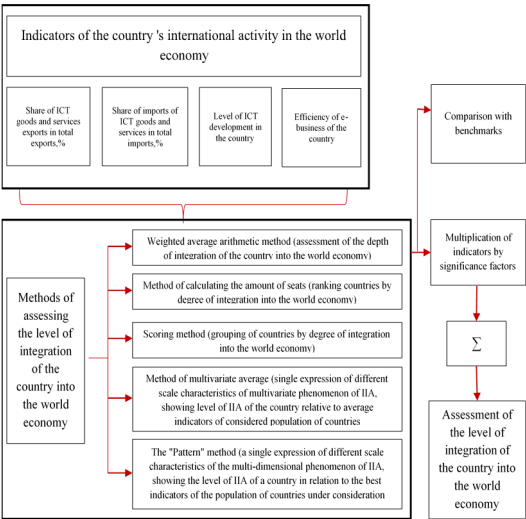
Figure 5 Algorithm for assessing the integration of the country into the world economy
Source: compiled by the authors on the basis of the data of Figure 1

We will assess the level of integration of Russia into the world economy on the basis of comparison of the indicators of 2016 and 2017 - the period before and after the introduction of the neural network technology offered by us to increase the efficiency of electronic business. In the calculations, the company indicator will be averaged (based on the calculation of 5 companies (data on the application fully automated and translated into the electronic environment) using the automated program "AAB") in order to assess the national average level of e-business efficiency and the overall level of integration taking into account the efficiency of e-business as its factor.

Table 10 Data for calculation of indcators of integration of the Russian Federation into the world economy, 2016-2017

Input data	Calculation	Year/Result	
		2016	2017
ICT Development Index (Measuring the Information Society Report 2017)		6,9	7,07
Exports of goods and services (BoP, current US$) (Exports of goods and services)		33235261 0000,0	411178710 000,0
Imports of goods and services (BoP, current US$) (Imports of goods and services)		26609656 0000,0	326989600 000,0
Goods exports (BoP, current US$) (Goods exports)		28170901 0000,0	353547360 000,0
Goods imports (BoP, current US$) (Goods imports)		19149432 0000,0	238125430 000,0
ICT service exports (BoP, current US$) (ICT service exports)		39037200 00,0	465275000 0,0
Communications, computer, etc. (% of service exports, BoP) (Communications, computer, etc. (а)		47,8	47,7
Communications, computer, etc. (% of service imports, BoP) (Communications, computer, etc. (и)		48,0	44,9
ICT service exports (% of service exports, BoP) (ICT service exports)		7,7	8,1
ICT goods exports (% of total goods exports (ICT goods exports)		0,5	0,6
ICT goods imports (% total goods imports) (ICT goods imports)		8,9	9,2
Service exports (BoP, current US$) (Service exports)		50643600 000,0	998239704, 1
Service imports (BoP, current US$) (Service imports)		74602240 000,0	102801803 7,9
Export of goods ICT, ICT,US dollar	ICT goods exports / Goods exports * 100%	15409482 84,7	204464664 2,4
ICT, US dollar	ICT goods imports / Goods imports *100%	16958736 979,2	219249295 45,4
Share of ICT goods and services in total exports,%	(ICT service exports + Export	1,638	1,629

	of goods of ICT) / Exports of goods and services * 100%		
Share of ICT goods in total imports,%	Imports of ICT goods, US $ USA / Imports of goods and services (BoP, current US$) * 100%	6,373	6,705

Source: The authors

Based on the calculations made (Table 10), the data needed for calculating the indicators of integration of the Russian Federation into the world economy were obtained (Table 11).

Table 11 Data for calculation of the level of integration of the Russian Federation into the world economy, 2016-2017

Year	Indicator			
	Level of ICT development in the country (ICT Development Index)	Share of ICT exports of goods and services in total exports of goods and services, % (x2)	Share of ICT goods and services imports in total exports of goods and services,% (x3)	Level of efficiency of e-business (average for 5 companies before and after implementation of our proposed algorithm) (x4)
2016	6,91	1,638	6,373	0,065
2017	7,07	1,629	6,705	0,135

Source: The authors

The maximum weight factor (40%) is the "level of efficiency of electronic business," considering that the efficiency of integration of the country into the world economy depends on the efficiency of companies operating in the world market of goods and services, in particular, electronic. The weight of the other three indicators is 20%.

The data is compared with the reference values (table 12) and based on the results of the comparison, the integration is evaluated using the selected methods. The benchmarks of the level of ICT development in the country, the share of exports and imports of ICT goods and services in the total volume of exports and imports of goods and services in this table are the average indicator of the maximum, average and minimum value for 200 countries of the world in 2017. The value of the indicator varies between [-1; 1].

Table 12 Reference values of indicators of integration of the country into the world economy

Index	Reference Value		
	3	2	1
Level of ICT development in the country (ICT Development Index), point (x1)	8,98=>x>5,123	= 5,123	0,96>=x<5,123
Share of ICT services exports in total exports of goods and services,% (x2)	43,31=>x>4,194	= 4,194	0>=x<4,194

Share of ICT-related imports in total exports of goods and services,% (x3)	45,575=>x>3,81	= 3,81	0>=x<3,81
E-Business Efficiency Level (x4) total	1=>x>0	= 0	0>=x<1
Total	12	8	4

Source: The authors

Table 13 provides an assessment of the degree of integration of the Russian economy into the global economy, which was carried out using the arithmetic weighted average formula. The results are ranked according to the indicator level relative to the reference value (where 1 is the lowest level, 2 is the middle level, 3 is the highest level). Thus, the value can vary from 4 to 12. And taking into account the significance factor - from 1 to 3.

Table 13 Calculation of the level of integration of Russia into the world economy by comparing data with the benchmark

Index	Weight, a_i	Assessment (2016), x_{ij}	Assessment (2017), x_{ij}	Indication (2016), $a_i x_{ij}$	Indication (2017), $a_i x_{ij}$
X1 (ICT Development Index-2017)	0,20	6,91	7,07	0,6	0,6 ↑
X2	0,20	1,638	1,629	0,2	0,2 ↓
X3	0,20	6,373	6,075	0,6	0,6 ↑
X4	0,40	0,065	0,135	1,2	1,2 ↑
Total				2,6	2,6 ↑

Source: The authors

where the arrow shows the change of the indicator relative to the previous period.

With regard to the level of integration of the Russian Federation into the world economy, obtained by the method proposed, it can be noted that the level of integration equals 2.6 points, which is 0.4 points lower than the highest reference value. The level in 2016 and 2017 is the same, but the dynamics of indicators (3 out of 4) is positive.

Based on the data received, it can be noted that in 2017 the level of integration of Russia into the world economy increased on average by 25% relative to the indicator of 2016. First of all, such increase could be explained via the increase in the efficiency of the representatives of electronic business. This confirms the attractiveness of the implementation of the proposed developments in this article to increase the efficiency of enterprises operating in the electronic environment and the methodology of assessing the efficiency of electronic business as an indicator of the overall integration of Russia into the world economy.

Conclusion

The goal of the article was in the development of relevant methodology for assessing the integration of countries into the world economy. Theoretical and practical aspects of "neural network modelling" have been developed and the degree of its use in the process of increasing the efficiency of electronic business has been revealed. In particular, a number of conclusions and provisions have been formulated:

1. Processes of integration of enterprises and, as a result, countries into the world economy are possible due to optimization of their activities.

2. The ability to increase the efficiency of a certain enterprise becomes possible via the utilization of neural network technologies, one of which was proposed in this article. Its implementation can be supplemented by an efficiency assessment tool.

3. On the basis of modelling the methodology of assessing the efficiency of electronic business, proposing criteria and benchmarks of its activity, the tools for the development of the digital economy can be developed.

4. Another goal was also to develop a set of performance indicators for international companies operating in an electronic environment using information and communication technologies. The proposed complex is considered as a basis for the development of relevant method of assessing the effectiveness of e-business, which is one of the elements of the assessment of the indicator "the degree of integration of the country into the world economy." Among the main features and characteristics that distinguish it from existing methods of measuring the effectiveness of electronic business are the level of financial stability, competitiveness, investment attractive-ness and indicators of specific activity of international companies in the electronic environment, which all have been accounted for.

5. The methodology of integration evaluation using the method of e-business efficiency assessment is developed. The method was tested via the developed for this purpose program code "AAB" (written in the programming language Golang) on the basis of the data of the analysis of the companies operating on the Russia market.SM

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Strakić, F., Mirković, D., Boškov, T., Ljubojević, K., Tanasijević, V., Dimitrijević, M., et al. (2003). Metadata in data warehouse. *Strategic Management, 11*, 122-132.

➲ **Magazine article**

Strakić, F. (2005, October 15). Remembering users with cookies. *IT Review, 130*, 20-21.

➲ **Newsletter article with author**

Dimitrijević, M. (2009, September). MySql server, writing library files. *Computing News, 57,* 10-12.

➲ **Newsletter article without author**

VBScript with active server pages. (2009, September). *Computing News,57,* 21-22.

B. BOOKS, BROCHURES, BOOK CHAPTERS, ENCYCLOPEDIA ENTRIES, AND BOOK REVIEWS

Basic format for books

Author, A. A. (Year of publication). *Title of work: Capital letter also for subtitle.* Location: Publisher.

Note: "Location" always refers to the town/city, but you should also include the state/country if the town/city could be mistaken for one in another country.

➲ **Book, one author**

Ljubojević, K. (2005). *Prototyping the interface design.* Subotica: Faculty of Economics.

➲ **Book, one author, new edition**

Dimitrijević, M. (2007). *Customer relationship management* (6th ed.). Subotica: Faculty of Economics.

➲ **Book, two authors**

Ljubojević, K., Dimitrijević, M. (2007). *The enterprise knowledge portal and its architecture.* Subotica: Faculty of Economics.

➲ **Book, three to six authors**

Ljubojević, K., Dimitrijević, M., Mirković, D., Tanasijević, V., & Perić, O. (2006). *Importance of software testing.* Subotica: Faculty of Economics.

➲ **Book, more than six authors**

Mirković, D., Tanasijević, V., Perić, O., Jovanov, N., Boškov, T., Strakić, F., et al. (2007). *Supply chain management.* Subotica: Faculty of Economics.

➲ **Book, no author or editor**

Web user interface (10th ed.). (2003). Subotica: Faculty of Economics.

➲ **Group, corporate, or government author**

Statistical office of the Republic of Serbia. (1978). *Statistical abstract of the Republic of Serbia.* Belgrade: Ministry of community and social services.

➲ **Edited book**

Dimitrijević, M., & Tanasijević, V. (Eds.). (2004). *Data warehouse architecture.* Subotica: Faculty of Economics.

➲ **Chapter in an edited book**

Boškov, T., & Strakić. F. (2008). Bridging the gap: Complex adaptive knowledge management. In T. Boškov & V. Tanasijević (Eds.), *The enterprise knowledge portal and its architecture* (pp. 55-89). Subotica: Faculty of Economics.

➲ **Encyclopedia entry**

Mirković, D. (2006). History and the world of mathematicians. In *The new mathematics encyclopedia* (Vol. 56, pp. 23-45). Subotica: Faculty of Economics.

C. UNPUBLISHED WORKS

➲ **Paper presented at a meeting or a conference**

Ljubojević, K., Tanasijević, V., Dimitrijević, M. (2003). *Designing a web form without tables.* Paper presented at the annual meeting of the Serbian computer alliance, Beograd.

➲ **Paper or manuscript**

Boškov, T., Strakić, F., Ljubojević, K., Dimitrijević, M., & Perić, O. (2007. May). *First steps in visual basic for applications.* Unpublished paper, Faculty of Economics Subotica, Subotica.

➲ Doctoral dissertation

Strakić, F. (2000). *Managing network services: Managing DNS servers.* Unpublished doctoral dissertation, Faculty of Economics Subotica, Subotica.

➲ Master's thesis

Dimitrijević, M. (2003). *Structural modeling: Class and object diagrams.* Unpublished master's thesis, Faculty of Economics Subotica, Subotica.

D. ELECTRONIC MEDIA

The same guidelines apply for online articles as for printed articles. All the information that the online host makes available must be listed, including an issue number in parentheses:

Author, A. A., & Author, B. B. (Publication date). Title of article. *Title of Online Periodical, volume number*(issue number if available). Retrieved from http://www.anyaddress.com/full/url/

➲ Article in an internet-only journal

Tanasijević, V. (2003, March). Putting the user at the center of software testing activity. *Strategic Management, 8* (4). Retrieved October 7, 2004, from www.ef.uns.ac.rs/sm2003

➲ Document from an organization

Faculty of Economics. (2008, March 5). *A new approach to CRM.* Retrieved July 25, 2008, from http://www.ef.uns.ac.rs/papers/acrm.html

➲ Article from an online periodical with DOI assigned

Jovanov, N., & Boškov, T. A PHP project test-driven end to end. *Management Information Systems,* 2 (2), 45-54. doi: 10.1108/06070565717821898.

➲ Article from an online periodical without DOI assigned

Online journal articles without a DOI require a URL.

Author, A. A., & Author, B. B. (Publication date). Title of article. *Title of Journal, volume number.* Retrieved from http://www.anyaddress.com/full/url/

Jovanov, N., & Boškov, T. A PHP project test-driven end to end. *Management Information Systems,* 2 (2), 45-54. Retrieved from http://www.ef.uns.ac.rs/mis/TestDriven.html.

REFERENCE QUOTATIONS IN THE TEXT

➲ Quotations

If a work is directly quoted from, then the author, year of publication and the page reference (preceded by "p.") must be included. The quotation is introduced with an introductory phrase including the author's last name followed by publication date in parentheses.

According to Mirković (2001), "The use of data warehouses may be limited, especially if they contain confidential data" (p. 201).

Mirković (2001), found that "the use of data warehouses may be limited" (p. 201). What unexpected impact does this have on the range of availability?

If the author is not named in the introductory phrase, the author's last name, publication year, and the page number in parentheses must be placed at the end of the quotation, e.g.

He stated, "The use of data warehouses may be limited," but he did not fully explain the possible impact (Mirković, 2001, p. 201).

➲ **Summary or paraphrase**

According to Mirković (1991), limitations on the use of databases can be external and software-based, or temporary and even discretion-based. (p.201)

Limitations on the use of databases can be external and software-based, or temporary and even discretion-based (Mirković, 1991, p. 201).

➲ **One author**

Boškov (2005) compared the access range…

In an early study of access range (Boškov, 2005), it was found...

➲ When there are **two authors**, both names are always cited:

Another study (Mirković & Boškov, 2006) concluded that…

➲ If there are **three to five authors**, all authors must be cited the first time. For subsequent references, the first author's name will cited, followed by "et al.".

(Jovanov, Boškov, Perić, Boškov, & Strakić, 2004).

In subsequent citations, only the first author's name is used, followed by "et al." in the introductory phrase or in parentheses:

According to Jovanov et al. (2004), further occurences of the phenomenon tend to receive a much wider media coverage.

Further occurences of the phenomenon tend to receive a much wider media coverage (Jovanov et al., 2004).

In "et al.", "et" is not followed by a full stop.

➲ **Six or more authors**

The first author's last name followed by "et al." is used in the introductory phrase or in parentheses:

Yossarian et al. (2004) argued that…

… not relevant (Yossarian et al., 2001).

➲ Unknown author

If the work does not have an author, the source is cited by its title in the introductory phrase, or the first 1-2 words are placed in the parentheses. Book and report titles must be italicized or underlined, while titles of articles and chapters are placed in quotation marks:

A similar survey was conducted on a number of organizations employing database managers ("Limiting database access", 2005).

If work (such as a newspaper editorial) has no author, the first few words of the title are cited, followed by the year:

("The Objectives of Access Delegation," 2007)

Note: In the rare cases when the word "Anonymous" is used for the author, it is treated as the author's name (Anonymous, 2008). The name Anonymous must then be used as the author in the reference list.

➲ Organization as an Author

If the author is an organization or a government agency, the organization must be mentioned in the introductory phrase or in the parenthetical citation the first time the source is cited:

According to the Statistical Office of the Republic of Serbia (1978), …

Also, the full name of corporate authors must be listed in the first reference, with an abbreviation in brackets. The abbreviated name will then be used for subsequent references:

The overview is limited to towns with 10,000 inhabitants and up (Statistical Office of the Republic of Serbia [SORS], 1978).

The list does not include schools that were listed as closed down in the previous statistical overview (SORS, 1978).

➲ When citing more than one reference from the same author:

(Bezjak, 1999, 2002)

➲ When several used works by the same author were published in the same year, they must be cited adding a, b, c, and so on, to the publication date:

(Griffith, 2002a, 2002b, 2004)

➲ Two or more works in the same parentheses

When two or more works are cited parenthetically, they must be cited in the same order as they appear in the reference list, separated by a semicolon.

(Bezjak, 1999; Griffith, 2004)

➲ Two or more works by the same author in the same year

If two or more sources used in the submission were published by the same author in the same year, the entries in the reference list must be ordered using lower-case letters (a, b, c…) with the year. Lower-case letters will also be used with the year in the in-text citation as well:

Survey results published in Theissen (2004a) show that…

➲ To **credit an author for discovering a work**, when you have not read the original:

> Bergson's research (as cited in Mirković & Boškov, 2006)…

Here, Mirković & Boškov (2006) will appear in the reference list, while Bergson will not.

➲ When **citing more than one author**, the authors must be listed alphabetically:

> (Britten, 2001; Sturlasson, 2002; Wasserwandt, 1997)

➲ When there is **no publication date**:

> (Hessenberg, n.d.)

➲ **Page numbers must always be given for quotations**:

> (Mirković & Boškov, 2006, p.12)
>
> Mirković & Boškov (2006, p. 12) propose the approach by which "the initial viewpoint…

➲ **Referring to a specific part of a work**:

> (Theissen, 2004a, chap. 3)
>
> (Keaton, 1997, pp. 85-94)

➲ **Personal communications, including interviews, letters, memos, e-mails, and telephone conversations**, are cited as below. (These are *not* included in the reference list.)

> (K. Ljubojević, personal communication, May 5, 2008).

FOOTNOTES AND ENDNOTES

A few footnotes may be necessary when elaborating on an issue raised in the text, adding something that is in indirect connection, or providing supplementary technical information. Footnotes and endnotes are numbered with superscript Arabic numerals at the end of the sentence, like this.[1] Endnotes begin on a separate page, after the end of the text. However, Strategic Management journal **does not recommend the use of footnotes or endnotes.**

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