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CONTENT/SADRŽAJ

A Message from the Editor-in-Chief

Serbian Journal of Engineering Management is a scientific journal, published by School of Engineering Management and Society of Engineering Management of Serbia. The Journal is cathegorized by the Ministry of education, science and technological development of the Republic of Serbia. From 2020 the Journal is accepted for indexing in EBSCO databases. This international Journal is dedicated to the wide scope of themes in engineering management and industrial engineering and is published semiannualy. The papers are presented in English, Serbian and other former Yugoslavian languages.

Themes included in the journal are: Engineering management, Industrial engineering, Project management, Strategic Management, Logistics, Operations management, Production systems management, Quality control, Quality management, Entrepreneurship, Risk management, Human resources management, Financial management, Information systems, High technologies management, Environmental management, Maintenance management, Creative industries management, Security management, and Marketing.

Editorial board is consisted of distinguished academics from various countries dedicated to establishing the highest academic standards and promoting engineering management principles in Serbia.

Information on the journal in English and Serbian can be found at the journal web page: https://fim.edu.rs/en/serbian-journal-of-engineering-management/.

Prof. Dr. Vladimir Tomašević, FRSA

Reč urednika

Serbian Journal of Engineering Management je naučno-stručni časopis, koji izdaje Fakultet za inženjerski menadžment i Društvo inženjerskog menadžmenta Srbije. Časopis je kategorisan od strane Ministarstva prosvete, nauke i tehnološkog razvoja. Časopis je takođe od 2020. godine prihvaćen za indeksiranje u EBSCO bazama. Ovaj međunarodni časopis je posvećen temama inženjerskog menadžmenta i industrijskog inženjerstva i izlazi dva puta godišnje (u januaru i julu). Zastupljeni jezici su engleski, srpski, kao i jezici država bivše SFRJ.

Teme zastupljene u časopisu su: inženjerski menadžment, industrijsko inženjerstvo, upravljanje projektima, strategijski menadžment, logistika, menadžment operacija, menadžment proizvodnih sistema, kontrola kvaliteta, upravljanje kvalitetom, preduzetništvo, upravljanje rizikom, upravljanje ljudskim resursima, finansijski menadžment, informacioni sistemi, menadžment u visokotehnološkim industrijama, menadžment životne sredine, menadžment održavanja, menadžment kreativnih industrija, bezbednosni menadžment i marketing.

Uredništvo časopisa čine istaknuti naučnici iz različitih zemalja sveta koji su posvećeni postavljanju visokog akademskog standarda i promocije principa inženjerskog menadžmenta u Srbiji.

Informacije o časopisu i poziv za autore, na srpskom i engleskom jeziku, nalaze se na web stranici časopisa: https://fim.edu.rs/istrazivanje-i-saradnja/naucno-strucni-casopis/.

Prof. dr Vladimir Tomašević, FRSA

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Gastronomija kao sredstvo upravljanja marketingom i razvoja ruralnih destinacija

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Apstrakt: Kulinarski doživljaj je nezaboravno iskustvo i vrhunac za mnoge turiste. Hrana sadrži "energiju ljubavi" i može imati snažan "push-up efekat". Svrha ovog rada je da identifikuje faktore koji utiču na kulinarsko iskustvo, i u tom kontekstu, da uvede hedonističku hranu iz Srbije. Rad je zasnovan na empirijskom istraživanju provedenom među 328 stranih turista „tragača za ukusom“ iz osam zemalja koji su od avgusta 2015. do avgusta 2017. posetili šest tradicionalnih seoskih imanja (Salaši) u seoskom odredištu Vojvodine (severna Srbija). Rezultati pokazuju da se hedonističko kulinarsko iskustvo smatra nepogrešivim elementom autentičnih putničkih iskustava (91,4%), te da adekvatni marketing veoma ukusne hrane (žuta supa od živine sa rezancima i jetricima, ćevapi, domaće kobasice itd.) najviše doprinose razvoju turističkih destinacija.

Ključne reči: Kulinarski turizam, marketing menadžment, razvoj destinacije, Srbija

Gastronomy as a mean of marketing management and rural destination development

Abstract: Culinary experience is an unforgettable experience and a highlight for many tourists. The food contains "energy of love" and can be a powerful “push-up effect”. The purpose of this paper is to identify factors that influence the culinary experience, and in this context, to introduce hedonistic food from Serbia. The paper is based on empirical research carried out amongst 328 foreign tourists “taste trekkers” from eight countries who visited six traditional farmhouses (Salaši) in the rural destination of Vojvodina Province (Northern Serbia) from August 2015 to August 2017. The results indicate that hedonistic culinary experience has been regarded as an infallible element of authentic travel experiences (91.4%), and that adequate marketing of very delicious food (yellow poultry soup with noodles and liver dumplings, kebab, homemade sausages, etc.) are the attributes that most affected tourist destination development.

Keywords: Culinary Tourism, Marketing Management, Destination Development, Serbia

1. Introduction

While destinations were traditionally viewed as well-defined geographical areas, nowadays it is widely accepted that "destination has become some kind of individual experience which is interpreted subjectively by consumers" (Buhalis, 2000, p. 97). It can be said that specific places make distinctive tastes and according to Lee et al. (2015), unique local “taste of place”, and “love at first bite” concept will contribute to the creation of a strong place brand and will facilitate the rural development. To go further, it can be said that tourism at a destination is a range of experiences, which comprise invisible network connecting at the same time many needs and motives: local culture exploration; reflection of subjective perception; the embodiment of authentic travel experience; education opportunity; representation of prestige and status; influence of reference group, etc.

On the other hand, food tourists (so called "taste trekkers") are in search for authentic or new culinary experiences and also some kind of "adventure". According to Fields (2002) tourists' culinary experiences are considered as multi-dimensional consumption of the tourism system of which local foods are a part. Although culinary tourism is becoming a very important segment of the travel industry (Hjalager & Corigliano, 2000), only few studies examined the relationships between destination competitiveness and hedonistic culinary experiences in culinary tourism (Mason, Paggiaro, 2012). Some researchers suggested that tourists who value hedonistic culinary experiences are more motivated to approach new experiences in global (Smith, 2001; Everett, Aitchison, 2008). In this contest, it can be said that hedonistic culinary experience is the pursuit and prioritizing of pleasure. Serbia is a paradise for food hedonists. Serbian traditional cuisine contains a myriad of flavors and smells, mixture of tastes as a result of influences of various nations who live in this region. This fusion of different influences represents unique hedonistic culinary experiences that can only be enjoyed in Serbia, especially as a part of diverse tourism offer in rural settings (Demirović et al. 2017; Mijatov et al., 2018). Serbian cuisine is characterized by highly diverse, strong and spicy food, which can be approximately described as a mixture of Turkish, Greek, Bulgarian, German and Hungarian cuisines.

The authors set the main hypothesis that hedonistic culinary experience from Serbia is a powerful marketing management tool and a mean of tourist destination competitiveness. In this sense, the primary goal of the study is to indicate that the marketing management is the possible modus why tourists enjoy food from Serbia. A survey was used for the purposes of this research, whereby 350 questionnaires were distributed and 328 of them were analyzed. The analysis led to the confirmation of the given hypothesis and lower level hypotheses. The SPSS program, version 23.0, and Pearson Chi-Square Test, ANOVA test, KMO, Bartlett's Test, Factor analysis and Cronbach’s Alpha Reliability Coefficient were used. In addition to the research data, the authors used the available statistical and other secondary documentation.

2. Literature review

Malone et al. (2014) defined hedonic consumption in tourism as a „multisensory”, leisure and high emotive aspects of consumer’s experience of products. In the wider concept “hedonistic culinary experience” is a term used to describe "traveling and enjoying to eat". The term “culinary tourism” was developed by Lucy Long in 1998 (Wolf, 2002; Horng et al., 2012). Long narrate culinary tourism as "partaking" in the specific or diverse food experiences related to a tourist destination. Smith (2001) followed the idea and proposed a definition focusing on basic motivational factors: “culinary tourism occurs when the recognition of regionally produced foods and beverages is a significant motivator or activity during the trip” (p. 3). In resumption of her research, Long (2004) accentuate that the culinary tourism experience is a way for tourists to delight and receive different local cultures. The desire to explore culture has been identified as an important motivation for tourist food consumption by several researchers (Fields, 2002; Kim et al., 2009; Kivela, Johns, 2003).

Scarpato (2002) pointed out that food can be a contemporary cultural resource as it satisfies all the conventional requirements of cultural tourism products. Fields (2002) stated that when tourists are experiencing new local cuisines, they are simultaneously experiencing a new culture. Since food reflects human cultures (Beardsworth, Keil, 1997), various aspects of the local food such as the way the local people eat, the food preparation process, and the taste of the local food provide “indicia” that are critical for reasonable the local culture. Accordingly, this explained one of the underlying reasons why many of the respondents were enthusiastic in tasting local Serbian food. Ksendzova et al (2015) suggested that people who “appreciate the pleasure” are more motivated to approach new experiences. Indeed, tourists tend to be intensely involved in the process of “food assessment” (Malone et al, 2014), which is often the result of subjective perception.

In relation to hedonistic culinary experiences it can be said that emotions as a result of subjective perception have a significant role to play in influencing tourists’ attitude towards food. Authenticity discovering has long been recognized as a key motivator in tourism experiences (Hughes, 1995; Wang, 1999; Cole, 2007), it has also been identified as one of the motivators influencing destinations development (Kim et al., 2009). Trying something new is widely accepted as a significant tourist motivation (Lee, Crompton, 1992; Warde, Martens, 2000). Fields (2002) claim that status-aware tourists like to explore new cuisines and food. Likewise, Kivela and Johns (2003) suggested that people often used dining out and traveling to assert social status. Kim et al. (2009) also identified prestige as one of the motivational factors for consuming local food. In addition, as the participants were interested in the kinds of food recommended by their reference groups, they were in pursuit of what is in "fashion". This coincides with Finkelstein's (1998) contention that tourists in quest of foreign gastronomic experience could have been motivated by the pursuit of "fashionability".

3. Research methodology

This study is based on modified *Local Food Preferences model*, previously employed in similar recent case-study (Chang et al., 2010). The motivational factors identified include: explore local culture, authentic travel experience, learning/education opportunity, prestige and status, reference group influence, and subjective perception. Since the purpose of this study is to generate understanding rather than to generalize findings to a large population, a purposive sampling method was adopted (Chang el al., 2010).

The sample of this study comprised 328 tourists originating from eight countries (Slovenia, Russia, Croatia, Italy, the Netherlands, the United Kingdom, Hungary and China). Within the five-point scale the item "Strongly agree" refers to the respondents' favorite opinions about the hedonistic food from Serbia and the item "Absolutely disagree" refers to their unfavorable opinions. The questionnaire was piloted in the summer of 2015.

Collected data were analyzed by employing the Statistical Package for the Social Sciences (SPSS) programme. Although there are a number of traditional farm houses (Serb. *Salaš*) in Vojvodina Province (Northern Serbia), six farms attractive for tourists have been selected for the analysis in this study. The following farms have been analyzed: *Dida Hornjakov salaš,* located near Sombor, *Salaš 137* in Čenej near Novi Sad, *Majkin salaš* in Palić, *Katai salaš* in Mali Iđoš, *Cvejin salaš* in Begeč, and *Perkov salaš* near Neradin in Fruška Gora National Park (Figure 1).

Figure 1. Territoriality of the farm houses in Vojvodina

The data were processed with the statistical program SPSS 23.0. Exploratory factor analysis is used in the analysis of the gathered data on the interconnections of the sets of variables. In order to explore the local food impact on the tourists' attitudes ANOVA test were applied.

We can see in the Table 1 that the meals are available in all farms, and are mainly based on farm cuisine prepared in a traditional way. Each farm is recognizable according to some regional gastronomic specialties.

Table 1 Specialty of traditional farm houses (Salaši) in Vojvodina Province

Name of farm house	**The Specialties of Traditional Farm Houses**
Dida Hornjakov Salaš	Yellow poultry soup with noodles and liver dumplings; rice with stewed stomachs; three kinds of sauce: cherry, tomato and dill; layered cake with poppy seeds, nuts, cherries, pumpkin.
Cvejin Salaš	Cabbage (from Futog or Begeč) with turkey, goat, beef; stuffed (Serb. *Sarmice*) cabbage (chard, horseradish leaves or vine leaves); baked sauerkraut (Serb. *Podvarak*); beans with smoked pork ribs and smoked pork knuckle; chicken stew; beef stew; pork delicacies.
Majkin Salaš	Turkey with apricots; turkey with pasta; pork chop in a sauce of apple; kebab (Serb. *Ćevapčići*); hamburger steak; smoked pork; white pork; homemade sausages; steak in a chutney sauce; chicken breast; fillet of chicken drumstick; the stewed intestine (Serb. *Škembići*).
Perkov Salaš	Chicken or beef stew with homemade noodles; tomato soup with zucchini; strudel with poppy seeds or nuts; homemade brandy; wine and fruit juices; old-fashioned cakes and sweet pies, plum jam; sweet dish made of watermelon, blackberries and wild strawberries.
Katai Salaš	Pasta dishes and various types of homemade bread.
Salaš 137	Pie with cheese (Serb. *Gibanica*); strudel with poppy seeds and nuts; pie with pumpkin (Serb. *Bundevara*); cooked meat and vegetables from the soup and five sauces; rolled veal; roast in cream; stuffed zucchini; plum dumplings; rice pudding (Serb. *Sutlijaš*); egg noodles cooked in milk and flour (Serb. *Šnenokle*).

The study started with the main hypothesis H: The hedonistic culinary experience from Serbia is a powerful marketing management tool and a mean of tourist destination competitiveness. In order to test the hypothesis H, it was necessary to answer to specific questions and to set certain low-level hypotheses. One of the most important questions that needed to be answered was: **How did you describe the taste of Serbian food**? In order to obtain the answer to this question, six low-level hypotheses were formed: h1 – Hedonistic culinary experience from Serbia is the way to explore local culture; h2 – Hedonistic culinary experience from Serbia is a reflection of subjective perception h3 – Hedonistic culinary experience from Serbia is an argument of authentic travel experience; h4 – Hedonistic culinary experience from Serbia is a good basis for learning/education opportunity; h5 – Hedonistic culinary experience from Serbia is a simulacrum of prestige and status; and h6 – Hedonistic culinary experience from Serbia is an influence of reference group.

4. Results and discussion

The Table 2 shows that the largest percentage of participants comes from Slovenia (93 people – 28.4%) and Russia (64 people – 19.5%). The respondents from Croatia and Italy are equally represented (44 people – 13.4%), the same as the respondents from the Netherlands (24 people – 7.3%) and the UK (27 people – 8.2%), while the least percentage of respondents comes from China (7 people – 2.1%).

Table 2 Country of origin

Name of the country	**Frequency**	**Percent**
Croatia	44	13.4
Russia	64	19.5
The Netherlands	24	7.3
China	7	2.1
Italy	44	13.4
Slovenia	93	28.4
The UK	27	8.2
Hungary	25	7.6
Total	328	100%

Table 3 Results of the KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.857
Bartlett's Test of Sphericity	Approx. Chi-Square	1929.644
	df	15
	Sig.	0.000

Kaiser-Meyer-Olkin measure value was 0.857, which exceeds the recommended value of 0.60 (Kaiser, 1974). In addition, Bartlett's test of sphericity has achieved the needed statistical significance (*p*=0.000), which confirms the justification of the application of exploratory factor analysis (Table 4).

Table 4 Results of the Factor analysis

Items (Variables)		**Factor loading**	**Extraction Sums of Squared Loadings**	**% of Variance**
F1	Local food is the way to Explore local culture	.765	4.637	77.285
	Local food is argument of Authentic travel experience	.898		
	Local food is reflection of Subjective perception	.650		
	Local food is good basis for Learning/ education opportunity	.715		
	Local food is simulacrum of Prestige and status	.789		
	Local food is influence of Reference group	.820		

The reliability of the measurement instrument was checked by using *Cronbach's Alpha Reliability Coefficient*. In an ideal case, Cronbach's coefficient should be above 0.70 (DeVellis, 2003), but the values of this instrument are very sensitive to the number of items on the scale. As Pallant (2011) states, short scales (fewer than 10 items) usually have quite small Cronbach's coefficient (below 0.50). Bearing this in mind, we conclude that the set model is valid (Table 5).

Table 5 Cronbach's Alpha results

		N	**%**
Cases	Valid	328	100
Cronbach's Alpha		N of Items	
0.555		6	

According to data in the Table 6, it can be noted that the size of the statistical significance of $p<0.05$ is recorded in almost all cases: *LF1* (p=0.02), *LF2* (p=0.024), *LF3* (p=0.029), *LF4* (p=0.036) and LF6 p=0.001). This factors show an extremely high statistical significance among the mean scores of the respondents' attitudes.

Table 6 ANOVA Test results

		Sum of Squares	df	Mean Square	F	Sig.
Local food is the way to Explore local culture (LF1)	Between Groups	15.946	7	2.278	3.427	.002
	Within Groups	212.734	320	.665		
	Total	228.680	327			
Local food is reflection of Subjective perception (LF2)	Between Groups	12.089	7	1.727	2.341	.024
	Within Groups	236.106	320	.738		
	Total	248.195	327			
Local food is argument of Authentic travel experience (LF3)	Between Groups	9.397	7	1.342	2.267	.029
	Within Groups	189.526	320	.592		
	Total	198.924	327			
Local food is good basis for Learning/ education opportunity (LF4)	Between Groups	13.508	7	1.930	2.175	.036
	Within Groups	283.879	320	.887		
	Total	297.387	327			
Local food is simulacrum of Prestige and status (LF5)	Between Groups	7.542	7	1.077	.921	.490
	Within Groups	374.309	320	1.170		
	Total	381.851	327			
Local food is influence of Reference group (LF6)	Between Groups	27.467	7	3.924	3.502	.001
	Within Groups	358.530	320	1.120		
	Total	385.997	327			

Note: $p<0.05$ if the p-value associated with the F is smaller than p=0.05, then there are significant statistical differences among the observed groups.

Many participants articulated that they would be interested in anything that could represent the culture of Serbian food. It is interesting that 89.9% of the respondents strongly agree that “Hedonistic food from Serbia is the way to Explore local culture” (Table 7). Following Montanari (2006), Lee et al (2015) argued that “food is culture, and culture is food”, two-way relationship and an aspect of legacy, and that food is a language that overcomes all barriers. MacDonald and Deneault (2001) claimed that food and wine tourists fulfill their expectations when they “immerse themselves in the culture they are visiting through authentic and engaging experiences with people, cuisine, wine and other cultural activities” (p. 13). It can be said that “Love goes through the mouth”, and food is the widest form of tolerance and cultures of different nations respect.

Some of the specific responses were: “Food in Serbia is very delicious“, "Meat dishes are generally well spiced and hot", "Domestic food melts in your mouth", "Cakes and cookies are better than chocolate", "You just have to eat it because it is so tasty", etc. After examining the same Table 8 it can be concluded that there is a statistically significant difference in responses, which is p = 0.000. It shows that the respondents gave uniform answers. By analyzing these data, it can be concluded that the cause derives from the number of participants. In fact, there was not the same number of respondents in relation to their country of origin, so, the result is not surprising. The analysis of the data confirmed lower-level hypothesis h1 which states that Hedonistic culinary experience from Serbia is the way to explore local culture.

Table 7 Hedonistic culinary experience from Serbia as the way to explore local culture

Hedonistic culinary experience from Serbia is the way to explore local culture		**Absolutely disagree**	**Partially disagree**	**No opinion**	**Partially agree**	**Strongly agree**	**Total**
Country of origin	Croatia	3	2	4	0	35	44
		0.9%	0.6%	1.2%	0%	10.7%	13.4%
	Russia	0	3	5	4	52	64
		0%	0.9%	1.5%	1.2%	15.9%	19.5%
	The Netherlands	0	2	2	6	14	24
		0%	0.6%	0.6%	1.8%	4.3%	7.3%
	China	0	0	0	1	6	7
		0%	0%	0%	0.3%	1.8%	2.1%
	Italy	0	3	5	9	27	44
		0%	0.9%	1.5%	2.7%	8.2%	13.4%
	Slovenia	1	1	1	2	88	93
		0.3%	0.3%	0.3%	0.6%	26.8%	28.4%
	The UK	0	0	0	2	25	27
		0%	0%	0%	0.6%	7.6%	8.2%
	Hungary	0	1	0	5	19	25
		0%	0.3%	0%	1.5%	5.8%	7.6%
Total		4	12	17	29	266	328
		1.2%	3.7%	5.2%	8.8%	81.1%	100%

Table 8 Pearson Chi-Square test results

Value	**df**	**Statistical significance (p)**
64.454[a]	28	0.000

Another factor that activated the respondents to taste hedonistic food from Serbia was the “subjective perception” about Serbian food (Table 9). Some participant’s utterance corroborated this contention: "The food is great for gaining weight", "Soups are healing" and "The portions are very extensive". Many respondents identified the role of subjective perception as source of hedonic value experienced during their traveling. Based on the values p=0.000, statistically significant differences can be seen in responses of different categories (Table 10). It shows that the respondents gave uniform answers. Bearing in mind that 69.5% of all participants strongly agree and partially agree that “Hedonistic culinary experience from Serbia is a reflection of subjective perception”, the data confirmed lower-level hypothesis h2 stating that Hedonistic culinary experience from Serbia is a reflection of Subjective perception.

Table 9 Hedonistic culinary experience from Serbia as reflection of subjective perception

Hedonistic culinary experience from Serbia is reflection of subjective perception		**Absolutely disagree**	**Partially disagree**	**No opinion**	**Partially agree**	**Strongly agree**	**Total**
Country of origin	Croatia	3	2	15	14	10	44
		0.9%	0.6%	4.6%	4.3%	3%	13.4%
	Russia	5	2	18	22	17	64
		1.5%	0.6%	5.5%	6.7%	5.2%	19.5%
	The Netherlands	0	4	6	13	1	24
		0%	1.2%	1.8%	4.0%	0.3%	7.3%
	China	0	0	0	7	0	7
		0%	0%	0%	2.1%	0%	2.1%
	Italy	3	5	9	23	4	44
		0.9%	1.5%	2.7%	7.0%	1.2%	13.4%
	Slovenia	0	0	15	72	6	93
		0%	0%	4.6%	22%	1.8%	28.4%
	The UK	0	0	3	20	4	27
		0%	0%	0.9%	6.1%	1.2%	8.2%
	Hungary	0	1	9	13	2	25
		0%	0.3%	2.7%	4.0%	0.6%	7.6%
Total		11	14	75	184	44	328
		3.4%	4.3%	22.9%	56.1%	13.4%	100%

Table 10 Pearson Chi-Square test results

Value	**df**	**Statistical significance (p)**
82.462	28	0.000

Another important reason for the respondents to partake of hedonistic food from Serbia (Table 11) was the desire for an “authentic travel experience”. There is an old saying that says "When in Rome, do as the Romans do"; this belief was epitomized in the following comment: "Serbian sausage (Serb. *Kulen*) and cream cheese (Serb. *Kajmak*) are a heavenly experience; food is mostly based on meat, cabbage and potatoes; ground beef/pork patty (Serb. *Pljeskavica*) with onions and kajmak are a gift of gods". For the respondents who held this belief, they considered food to have a greater value on the cultural and intellectual aspects than on physical pleasure, and they sought for culinary experiences that were unique and original when they travel. Hence, they felt that they were being brought closer to Serbia when they were totally immersed in the authentic local eating experience. Based on the values p=0.000, statistically significant differences can be seen in responses of different categories (Table 12). Most participants (91.4%) agree with the attitude that hedonistic culinary experience from Serbia is an argument of authentic travel experience, which is the confirmation of lower-level hypothesis h3.

Table 11 Hedonistic culinary experience from Serbia as authentic travel experience

Hedonistic culinary experience from Serbia is argument of authentic travel experience		**Absolutely disagree**	**Partially disagree**	**No opinion**	**Partially agree**	**Strongly agree**	**Total**
Country of origin	Croatia	4	1	1	1	37	44
		1.2%	0.3%	0.3%	0.3%	11.3%	13.4%
	Russia	0	3	4	2	55	64
		0%	0.9%	1.2%	0.6%	16.8%	19.5%
	The Netherlands	0	2	2	0	20	24
		0%	0.6%	0.6%	0%	6.1%	7.3%
	China	0	0	0	0	7	7
		0%	0%	0%	0%	2.1%	2.1%
	Italy	0	0	8	0	36	44
		0%	0%	2.4%	0%	11.0%	13.4%
	Slovenia	2	0	0	0	91	93
		0.6%	0%	0%	0%	27.7%	28.4%
	The UK	0	0	0	0	27	27
		0%	0%	0%	0%	8.2%	8.2%
	Hungary	0	0	1	0	24	25
		0%	0%	0.3%	0%	7.3%	7.6%
Total		6	6	16	3	297	328
		1.8%	1.8%	4.9%	0.9%	90.5%	100%

Table 12 Pearson Chi-Square test results

Value	**df**	**Statistical significance (p)**
60.061	28	0.000

Some of the respondents rated tasting hedonistic food from Serbia as a ‘‘learning/education’’ opportunity (Table 13). They considered that eating hedonistic food from Serbia would enable them to acquire new food knowledge so that they could have the capacity to discuss and evaluate Serbian food. Hence, the respondents could enrich their ‘‘cultural capital’’, a term which denotes the knowledge that enables an individual to interpret various cultural codes (Bourdieu, 1984). Based on the values p=0.000 there are statistically significant differences in responses of different categories (Table 14). Lower-level hypothesis h4 was also confirmed because majority of participants agree (84.5%) that “Hedonistic culinary experience from Serbia is a good basis for learning/education opportunity.

Table 13 Hedonistic culinary experience from Serbia as learning/education opportunity

Hedonistic culinary experience from Serbia is good basis for learning/ education opportunity		**Absolutely disagree**	**Partially disagree**	**No opinion**	**Partially agree**	**Strongly agree**	**Total**
Country of origin	Croatia	4	1	2	12	25	44
		1.2%	0.3%	0.6%	3.7%	0.6%	13.4%
	Russia	0	7	11	9	37	64
		0%	2.1%	3.4%	2.7%	11.3%	19.5%
	The Netherlands	0	4	0	14	6	24
		0%	1.2%	0%	4.3%	1.8%	7.3%
	China	0	0	0	0	7	7
		0%	0%	0%	0%	2.1%	2.1%
	Italy	0	4	4	12	24	44
		0%	1.2%	1.2%	3.7%	7.3%	13.4%
	Slovenia	2	0	11	14	66	93
		0.6%	0%	3.4%	4.3%	20,1%	28.4%
	The UK	0	0	0	15	12	27
		0%	0%	0%	4.6%	3.7%	8.2%
	Hungary	0	0	1	17	7	25
		0%	0%	0.3%	5.2%	2.1%	7.6%
Total		6	16	29	93	184	328
		1.8%	4.9%	8.8%	28.4%	56.1%	100%

Table 14 Pearson Chi-Square test results

Value	**df**	**Statistical significance (p)**
105.588	28	0.000

Some of the participants indicated that they were motivated to taste hedonistic food from Serbia so that they could share such experiences with their friends (8.2%) when they returned home (Table 15). Accordingly, tasting hedonistic food has become same as souvenirs and mementos from the travel. The results obtained in this study show that respondents enjoy the Hedonistic culinary experiences from Serbia and when sharing their gastronomic experience with friends, they promote Serbia in the best manners. As with previous answer, there are statistically significant differences in responses of different categories (Table 16). On the basis of participants' statements that they absolutely disagree and partially disagree (86.3%) that "Hedonistic culinary experience from Serbia is a simulacrum of prestige and status", the lower-level hypothesis h5 is rejected as inaccurate.

Table 15 Hedonistic culinary experience from Serbia as simulacrum of prestige and status

Hedonistic food from Serbia is simulacrum of prestige and status		**Absolutely disagree**	**Partially disagree**	**No opinion**	**Partially agree**	**Strongly agree**	**Total**
Country of origin	Croatia	31	2	6	0	5	44
		9.5%	0.6%	1.8%	0%	1.5%	13.4%
	Russia	45	12	0	3	4	64
		13.7%	3.7%	0%	0.9%	1.2%	19.5%
	The Netherlands	20	0	0	2	2	24
		6.1%	0%	0%	0.6%	0.6%	7.3%
	China	4	1	2	0	0	7
		1.2%	0.3%	0.6%	0%	0%	2.1%
	Italy	36	0	0	4	4	44
		11%	0%	0%	1.2%	1.2%	13.4%
	Slovenia	72	12	7	0	2	93
		22%	3.7%	2.1%	0%	0.6%	28.4%
	The UK	19	5	3	0	0	27
		5.8%	1,5%	0.9%	0%	0%	8.2%
	Hungary	19	5	0	1	0	25
		5.8%	1.5%	0%	0.3%	0%	7.6%
Total		246	37	18	10	17	328
		75%	11.3%	5.5%	3%	5.2%	100%

Table 16 Pearson Chi-Square test results

Value	df	Statistical significance (p)
63.235	28	0.000

Some respondents were interested in tasting various local foods that were recommended to them by their ‘‘reference groups”, (Table 17), such as their friends, celebrities or Internet (Facebook, Instagram etc.).

Table 17 Hedonistic culinary experience from Serbia as influence of reference group

Hedonistic food from Serbia is influence of reference group		**Absolutely disagree**	**Partially disagree**	**No opinion**	**Partially agree**	**Strongly agree**	**Total**
Country of origin	Croatia	5	1	0	9	29	44
		1.5%	0.3%	0%	2.7%	8.8%	13.4%
	Russia	7	0	0	21	36	64
		2.1%	0%	0%	6.4%	11%	19.5%
	The Netherlands	4	0	0	2	18	24
		1.2%	0%	0%	0.6%	5.5%	7.3%
	China	0	0	0	0	7	7
		0%	0%	0%	0%	2.1%	2.1%
	Italy	6	1	1	5	31	44
		1.8%	0.3%	0.3%	1.5%	9.5%	13.4%
	Slovenia	0	2	1	18	72	93
		0%	0.6%	0.3%	5.5%	22%	28.4%
	The UK	0	0	0	0	27	27
		0%	0%	0%	0%	8.2%	8.2%
	Hungary	1	0	0	0	24	25
		0.3%	0%	0%	0%	7.3%	7.6%
Total		23	4	2	55	244	328
		7%	1.2%	0.6%	16.8%	74.4%	100%

Table 18 Pearson Chi-Square test results

Value	df	Statistical significance (p)
54.773	28	0.002

Based on the values p=0.002 there are statistically significant differences in responses of different categories (Table 18). Lower-level hypothesis h6 was confirmed because majority of participants agreed (91.2%) that “Hedonistic culinary experience from Serbia is influence of a Reference group”.

5. Conclusion

According to results it can be concluded that the ability to discern tastes is tourist destination competitiveness, and can be a powerful tool of marketing management. Boyne et al., (2002), Oman et al., (2015) and Tsai and Wang (2016) founded that tourists spend from 30% to 40% of their budget on food when traveling. Further, Horng and Tsai (2010) argued that cuisines that are well known for taste and quality can be developed into tourism products. Lee et al. (2015) and Bowen and De Master (2011) argued that specific rural places can be recognized in the global market through the establishment of specific taste of destinations. Food tourism can provide interest and many positive changes to rural communities by bringing in tourists who, first and all spend money. Omar et al. (2015) noticed that tourism destination may be visited because of the unique local “taste of place” (it) served for tourists. They have found that food can increase the positive image of destinations because it is reflection of local life, local production and also heritage (Everett and Aitchison, 2008).

Serbian traditional cuisine contains a multiplicity of tastes that can only be enjoyed in Serbia. Serbian cuisine is characterized as multifarious, flavored and spicy, which can be approximately described as a mixture of Turkish, Hungarian, Bulgarian and Greek cuisines. The use of meat and dough is predominant in it, and they are integral parts of many national dishes, such as ground beef/pork patty (Serb. *Pljeskavica*), grilled minced meat (Serb. *Ćevapi*), Karadjordje's schnitzel (Serb. *Karađorđeva šnicla*), etc. The national drink is plum brandy (*šljivovica* or homemade *rakija*). It can be said that tourists tend to be deeply involved in the process of "tasting place", and through food tourism, tourists can have authentic experiences. Tourism choice is generally bound by hedonic motivations. Tourists love to please themselves and they often travel to enjoy. The results we obtained tend to be viewed as a motivator for vacation choice and tourist destination competitiveness. The point of view received here is consistent with a phenomenological understanding of "taste of place". Tourist destinations must be recognizable to be competitive. Food tourism is a remarkable way to do it.

It is evident from this study that there are three main sources of hedonic value: Hedonistic culinary experience from Serbia is an argument of authentic travel experience (91.4%), Hedonistic culinary experience from Serbia is an influence of a Reference group (91.2%), and Hedonistic culinary experience from Serbia is the way to explore local culture (89.9%). According to these findings, we can conclude that hedonistic culinary experience from Serbia is a powerful tool that can be used in promotions of rural destination and is a means of tourist destination competitiveness. This confirms the main hypothesis.

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Moderno upravljanje u funkciji povećanja kvaliteta usluga u primarnim zdravstvenim ustanovama

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Apstrakt: Republički fond za zdravstveno osiguranje zadužen je za upravljanje i osiguranje obaveznog osiguranja, dok se dobrovoljno osiguranje može osigurati privatnim osiguranjem. Predmet ovog rada je analiza načina uvođenja i primene savremenog upravljanja u primarnoj i/ili preventivnoj zdravstvenoj delatnosti koja je identifikovana kao pokretač promena u reformi zdravstvenog sistema Srbije, sa osvrtom na sve njene segmente i elemente koji direktno utiču na pružanje zdravstvenih usluga (planiranje - identifikacija misije, ciljevi i strategije, implementacija i evaluacija), koristeći primere iz prakse. Primarna zdravstvena zaštita sastavni je, trajni i sveobuhvatni deo formalnog sistema zdravstvene zaštite u svim državama, i/ili se smatra sredstvom kojim se uravnotežuju dva osnovna cilja zdravstvenog sistema - optimizacija i ravnoteža u distribuciji zdravstvenih usluga kroz sistem visokokvalitetnog upravljanja zdravljem. Prepoznato je kao potencijalno rješenje u funkcioniranju zdravstvenog sustava s potrebom prebacivanja fokusa na preventivu i/ili preuzimanje 80% ukupnih zdravstvenih usluga koje bi se trebale pružiti u primarnoj zdravstvenoj zaštiti. Dakle, tema ovog rada isključivo je aktualna i nužna kako bi se utvrdio nivo primene modernog menadžmenta u ustanovama primarne zdravstvene zaštite, kao i pokrenuli procesi prema podizanju nivoa iste.

Ključne reči: Menadžment u zdravstvu; primarna zdravstvena zaštita; poboljšanje kvaliteta zdravstvene zaštite

Modern management in the function of increasing of health service quality in primary health care

Abstract: The Republic Health Insurance Fund is in charge of management and securing of compulsory insurance, while voluntary insurance can be ensured through private insurance. The subject of this paper is the analysis of the way of introduction and application of modern management in primary, and/or preventive health activity that is identified as the agent of changes in the reform of the health system of Serbia, with reference to all its segments and elements that directly influence on providing the health services (planning - mission identification, goals and strategies, implementation and evaluation), using the examples from practice. Primary health care is integral, permanent and comprehensive part of formal system of health care in all states, and/or it is considered as the means by which two basic goals of health care system are balanced - optimization and balance in the distribution of health services through the system of high-quality health management. It is recognized as a potential solution in functioning of the health care system with the need of shifting the focus on the preventive, and/or taking over of 80% of total health services that should be provided in the primary health care. So the theme of this paper is exclusively current and necessary so as to determine the level of application of modern management in the institutions of primary health care, as well as to start the processes toward the raising the level of the same.

Key words: Healthcare management; health care; improving the quality of health care

1. Introduction

The decision-making process indicates complex procedures that involve numerous factors such as legislation, politics, capital structure, and sources, culture, etc. Management of multilevel companies implies making decisions about specific activities of their organizations. Moreover, internal and external factors have a substantial influence on organizational performance (Nedeljkovic, 2017). Health is the state of complete physical, mental and social welfare, and not only the absence of illness or incapability – the World Health Organisation (WHO), 1946. The concepts of "health" and "welfare" are significantly equalized by this definition, which means both physical and mental health, but also the social adaptation and fulfillment.

During the decade of political and economic instability, and also the latest years followed by global economic crisis have led to the fact that the system of health care in the Republic of Serbia has become inadequate. In such circumstances, the attempts of reconstruction and improvement of services of health care are difficult in accordance with the citizens' needs. The health system in Serbia suffers from a lack of funds and investments, but it provides the basic service to the citizens. The health care in the Republic of Serbia is provided both through the state and private sector. The Law on Health Insurance of the Republic of Serbia regulates compulsory and voluntary health insurance.

The Republic Health Insurance Fund is in charge of management and securing of compulsory insurance, while voluntary insurance can be ensured through private insurance (Gavrilović and Trmčić, 2012). The Constitution guarantees the right to health and health care as the basic human right. That right assumes that all available resources of society are used in ensuring available, efficient and high-quality health care that meets the needs of citizens.The improvement of health largely depends on the effectiveness and success of functioning of health system. Effectiveness and success of health system can be strengthened through the development of primary (preventive) health care that will be organized according to the principle of scientific management, and/or modern management in whose centre is the model of family medicine. This paper will deal with the elaboration of this solution model within necessary reorganization and application of modern management in the institutions of primary health care in Serbia.

1.1. The subject of study

The subject of this paper is the analysis of the way of introduction and application of modern management in primary, and/or preventive health activity that is identified as the agent of changes in the reform of the health system of Serbia, with reference to all its segments and elements that directly influence on providing the health services (planning - mission identification, goals and strategies, implementation and evaluation), using the examples from practice. The paper treats and examines primary health care as integral, permanent and comprehensive part of the formal system of health care in all states, and/or it is seen as the means for balancing of two basic goals of health care system - optimization and balance in distribution of health services through the system of high-quality health management.

1.2. The problem of research

Everyday remarks and dissatisfaction with the functioning of health care in Serbia are sufficient motive for conducting the research with users of health care and in that part of the system where most health services are provided and achieved and with which the users of health care are firstly and usually encountered, and that is primary health care. The most common remarks that can be heard in the media, press and among patients are connected to poor work organization, long waiting for examination, unkindness of a doctor and other health personnel, inadequate examination by a doctor, as well as getting insufficient information from a doctor and health personnel about the pathological condition and treatment.

The need for research on this level of health care organization is great, because in the developed health systems, which are highly valued by the way of its business organization, primary health care is treated as the agent of all health system and provider of 80 % of services. Most of these problems can be eliminated or they would not exist if there was a good way of business organization on the level of health institution. By the application of modern management tools and techniques, the management of health institutions would establish the business system that would be thoroughly planned, organized, managed through every stage of application, with carefully chosen personnel and certainly controlled in every stage of provision of health service.

Considering the attempt of implementation and application of modern management in the institutions of primary health care, two health care centres are chosen to be winners of prestigious awards for quality and organization of business according to the principles of modern scientific management, where it has been researched whether the condition of the system is really bad or the patients in these institutions are satisfied with the treatment they get. On this basis, it can be established how much the modern management has really been implemented in the institutions of primary health care and whether it is a potential solution to the problems that occur in the functioning of the same.

1.3. The goal of the research

The scientific goal in this paper is the improvement of health care system, with the emphasis on preventive medicine, through consideration of the system of management in preventive health institutions, with defining the problems that occur or can occur in providing health services and finding the ways for increasing the level of the application of management quality of services in health care, as well as the identification of weak points in the process of management, with the basic goal of defining and launching the proposal for solving the identified problems.

The practical aim - coming to the knowledge whether a good business organization in health institutions (Health Care Centres) can compensate for the lack of financial means and adverse socio-economic impacts and meet the expectations of users by the quality of health service (Gavrilovic, 2014)

1.4. The basic hypotheses

Set hypotheses rely on defined goals of work as well as on primary research that will point at potential advantages and disadvantages of modern management in primary (preventive) health institution.

Hypotheses that are proved or disproved in this paper are the following:

Hypothesis general 0: By the respect of the principles of modern management and by its application in the institutions of primary health care, the dissatisfaction would be reduced both of givers and users of health services, and the lack of adequate apparatus and outdated technology for preventive diagnostics, as well as necessary work tools, would be filled and compensated for by a good organization. By the application of new work technology and management, the introduction of a new way (system) of business would be ensured, whereby the processes of work and communication among all participants in the system of health care would be accelerated and simplified, while the application of modern information technology would lead to significant saving in time and finances (reducing costs).

Hypothesis auxiliary 1: The application of the system of modern management, work standardization with patients, good communication, kindness of health workers and team work significantly influence on the quality of provided health service, as the crucial foundation for good work organization and the quality of provided health service.

Hypothesis auxiliary 2: The managers of health institutions have got positive attitude toward the improvement of the quality in the provision of health services to the patients, toward continuous medical education (specialization) and increasing the quality and professionalism in the work of health workers.

Hypothesis auxiliary 3: The motivation of the employees, in terms of the income they earn, for the work they perform and the possibility of professional development significantly influence on the attitude toward the user of health service, as well as the quality of provided service (Gavrilovic, 2014)

1.5. The methods used in the research

Several chosen methods that are adapted to the research area connected to defined topic have been used for the purpose of writing of this paper. Much theoretical knowledge based on many domestic and foreign, scientific and professional papers has been expressed as well, but also in a number of studies, strategies and reports whose subject is the research and analysis of primary (preventive) health care. In addition to secondary sources of information, the primary research has also been conducted by the method of survey, directed to dis/satisfaction of the users of health services and the employed in the health institution in the primary level of health care, and other numerous methods have also been applied such as: desk research, inductive-deductive method, method of analysis and synthesis, survey method and interview (survey questionnaire), statistical methods and methods of modelling, descriptive-statistical processing, mathematical statistics.

The subject of this research is the realization of patients' right established by the Law on Health Care of the Republic of Serbia and their (dis)satisfaction during the medical examination in the Health Centres Voždovac and Dr Milutin Ivković Palilula. Since the health centres perform the primary preventive health care, the research has been conducted in regard to the group of patients, workers, during the preventive examinations during 2013/2014. Healthy, working active population has been chosen for the survey because of the objectivity that sick users of services do not possess sufficiently. When a person is of impaired health or ill, under the influence of changes he/she becomes emotional and subjective, and thereby the objectivity and quality of the obtained results are lost

The selection of the Institutions of primary health care, and/or health care centres, where the surveying of users of health services and employees has been conducted, has been made in regard to the fact that both health care centres have been chosen as representative by the way of its organization and function.Both health care centres have been the winners of awards for the quality in the organization of business. Health Care Centre Voždovac gained recognition for an excellent development of strategic plan and management in the primary health care in 2010, and both health care centres were awarded for the best in continuous improvement of the quality of work in 2007 (on the territory of over 50 000 inhabitants), and as such, they were suitable for conducting the research. The quality of business is proved or disproved on the direct sample by this research through satisfaction or dissatisfaction of users of health services as well as the employees in the stated health care centres, and through this, the possibility of following the quality of provision of services and the insight into the way of modern management application are given in the institutions of primary health care.

The aim of this research is to consider the satisfaction of users in the primary health care, as well as the factors that influence on their satisfaction and/or dissatisfaction and also the satisfaction of the employees in the primary health care as a provider of health services. As the instrument of research, an anonymous questionnaire – the questionnaire designed on the basis of existing literature and recommendations of the World Health Organization (like the questionnaires that are used in the Institutes for health care of the population). The research was conducted during 2013/2014. All analysed aspects of users' satisfaction (continuity and frequency of using health care, the opinion of users about professional and personal problems, ratings of organizational aspect), accessibility and availability, respect of patient's opinion during the treatment, influence on general satisfaction with the doctor.

As one of the measurements of performances of the quality management system gives the information about observations of users about the extent to which their requirements are met through: The research of users' satisfaction, the data of users about the quality of provided service, the research of the patient's opinion, praise, complaints on professional work of the personnel and the attitude of the personnel toward the patients, respecting the rights of patients. The corresponding data were determined, collected and analysed by the research so as to show the suitability and effectiveness of the system of quality management and to evaluate the possibility of continuous improvement of the effectiveness of the system of quality management.

In each of the stated Institutions of primary health care, the research was conducted on two different groups of respondents. In the first stage, the research on the users of health care services was conducted, and in the second stage, the respondents were the employees in these health care institutions. The surveying of the users of services: Questionnaires for the users of services contain six basic questions, with the proviso that each of six questions on the sheet contains four sub-questions.

The basic questions in the questionnaire are:

1. Rate the waiting time of reception.
2. Rate the attitude toward you during the examination of the medical specialist.
3. Rate the quality of medical examination.

4. Rate the quality of apparatus by which the health examination has been performed.
5. Rate the reception and attitude of the employees toward you in the Health care centre.
6. Rate whether your rights have been respected as a patient.

In the questionnaires, the answers were proposed to the users of services, which they circled and thereby they gave their answer to the question: a) yes, b) no.

The description of questionnaires for the employees: The questionnaires contained the questions with the following elements on the basis of which the employees showed their dis/satisfaction:

1. Adequate equipment for work.
2. Interpersonal relations.
3. Direct cooperation with colleagues - team work.
4. Possibilities that you have got for continuous education.

The answers were proposed to the employees by the questionnaires. They circled the answers and thereby gave their answer to the question: a) very dissatisfied, b) dissatisfied, c) neither satisfied nor dissatisfied, d) satisfied, e) very satisfied. The third stage of the research was the processing of the data collected by the survey and the presenting of the results, conclusions and proposals (Gavrilovic, 2014). After the analysis of the questionnaires, the results were shown in tables and in percents by the chart.

1.6 Expected effects and research contribution

The results of the research represent an empirical basis for the analysis of the current state of the modern management application in the institutions of primary health care as a starting point for improvement of functioning of the same organisation. Scientific contribution of the paper is reflected in the representation of the problems that follow the health care in newly created circumstances of the need for the reform of health care system toward the sustainability and preservation of the quality with the emphasis on primary health care, identified as "gatekeeper of health care system".

Social significance of the paper is manifested through analytical approach t open question of future way of functioning of the health care system and health services on the national level. The importance of the paper is also contributed by primary results of the research on the level of functioning of health system in the circumstances of difficult general social and financial crisis and formation of current and future direction of development in the organization and providing of health services, according to the principles of modern management, through redistribution and restructuring toward the preventive, and/or primary health industry.

2. The management in health care

On a global scale “Manager” is the expression with multiple meanings, basically it represents the controller and the director. Therefore, they not only organize work in organizations, but they were directly involved in all decision making proceses such as planning and controlling (Rajkovic, 2017). Thus, healthcare management includes good management to provide good service.

The Management in health care:

1. Covers all process of planning, organization, implementation and control of work of health programs.
2. Coordinates the resources (personnel, finance, equipment, information, knowledge, technologies, regulations, law etc.).
3. Follows the development and application of health programs.
4. Provides support, influences on the participation of community and population.
5. Influences on making appropriate decisions on all levels of health system.
6. Pursues the objectives so as to improve the health condition of all population.

2.1. Types of health management

The management of health system (is ensured by the state - through its budget, taxes, premiums and other forms of insurance on the economic level; so the ministry of health, regional and local authority on the political level). The management of health care (is exclusively connected to planning, organization, management and control of functioning of health services and productivity in the health care on primary, secondary and tertiary level, and/or on the level of outpatient care, inpatient care, nursing and rehabilitation) – the level of health institution. Subgroups of health management are: Management of the case ("case-management") - patient-oriented part of health management. Management of the utilization ("utilization-management") - resource-oriented part of health management. Management of the disease ("disease-management") - management system of overall medical procedure and approach to certain disease (Pavic, 2007).

The quality in health care "High-quality medical care is fully satisfying of needs of those to whom the health service is most necessary, at the least cost to the organization, and within the limits and directives that are set by health legislations and financiers." (Ovretveit, 1995). The quality in health care must be analysed and implemented through three dimensions: 1. level of excellence; 2. reached level; 3. meeting certain needs of the system and of the users of services. Primary health care is based on a chosen doctor and his/her team. They represent "the gatekeepers" of the entrance into the health care system. Primary health care:

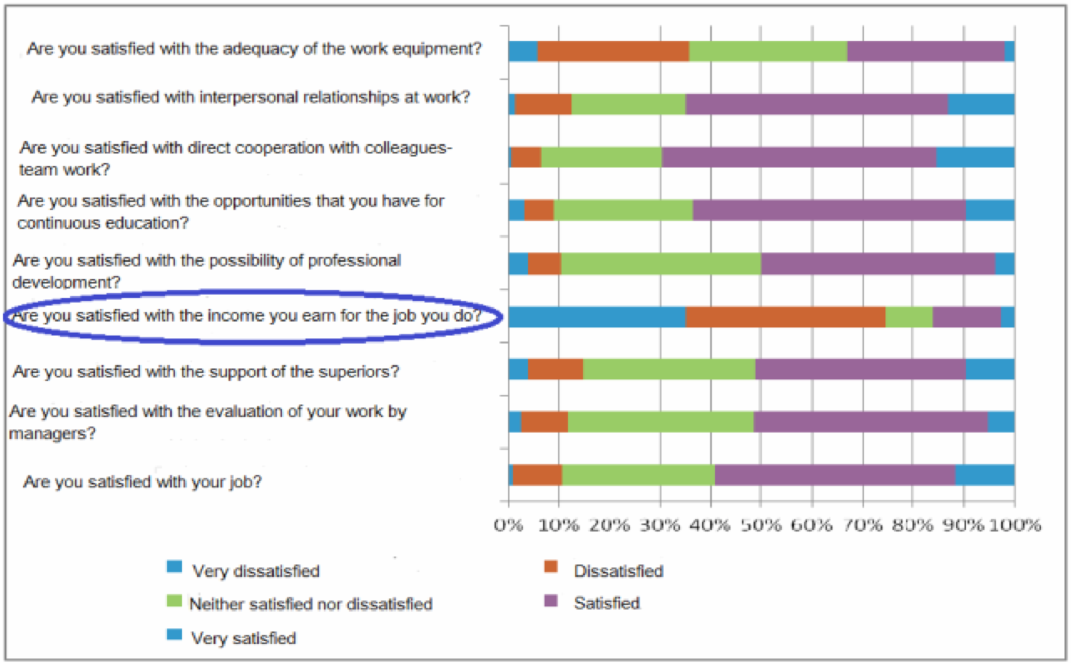
- ensures the solutions for over 85% of health problems in the population;
- presents the first contact with the health service;
- is closely located, oriented toward the individual, the family and the community, with
- effective communication;
- ensures the continuity that is determined by the needs of patients;
- resolves the acute and chronic health disorders;
- has got relatively low cost;
- involves multi-sectoral cooperation;
- puts the emphasis on the health promotion and prevention;
- applies the appropriate technologies for health.

4. The results of the research

4.1. Questionnaire for rating of professional satisfaction of employees

The questionnaire, whose questions referred to professional satisfaction of employees in health care centre, was done by 154 of the employees of which 89 have been employed in Health care centre "Palilula", and 65 of them in Health care centre "Voždovac". The sample consisted of 34 males and 115 females, while five people did not declare their gender. The youngest participant in this research was 22, and the oldest 60, while the average age was 44.35 (SD=9,059)

Figure 1: Distribution of answers of employees to all questions in connection with professional satisfaction



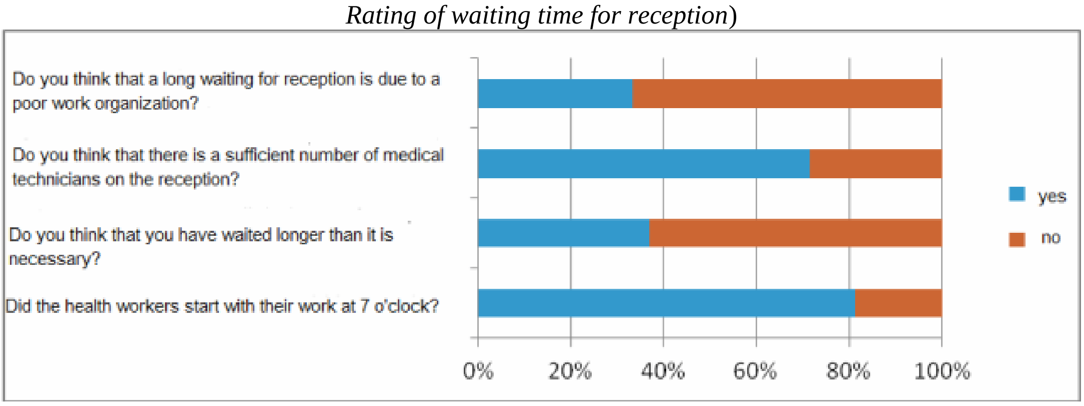
The source: Gavrilović A., *Primena savremenog menadžmenta u ustanovama primarne zdravstvene zaštite,* Doktorska disertacija, Beograd, 2014.

As it is shown in (Figure 1), to the most questions about professional satisfaction the employees have shown that they are satisfied or neither satisfied nor dissatisfied, except to the question about the income that they earn for the job they do, where more than 70% of respondents have shown that they are dissatisfied or very dissatisfied.

4.2. The questionnaire for rating of satisfaction of the users of health care (Graphic view and analysis of the results)

The questionnaire, whose questions referred to the satisfaction of the users of health services in the Health care centre, was done by a total of 162 people, of which 96 people in the Health care centre "Palilula", and 66 people in the Health care centre "Voždovac". The sample consisted of 72 males and 84 females, while six people did not declare their gender. The youngest participant in this research was 18, and the oldest was 82, while the average age was 46.42 (SD=12,771).

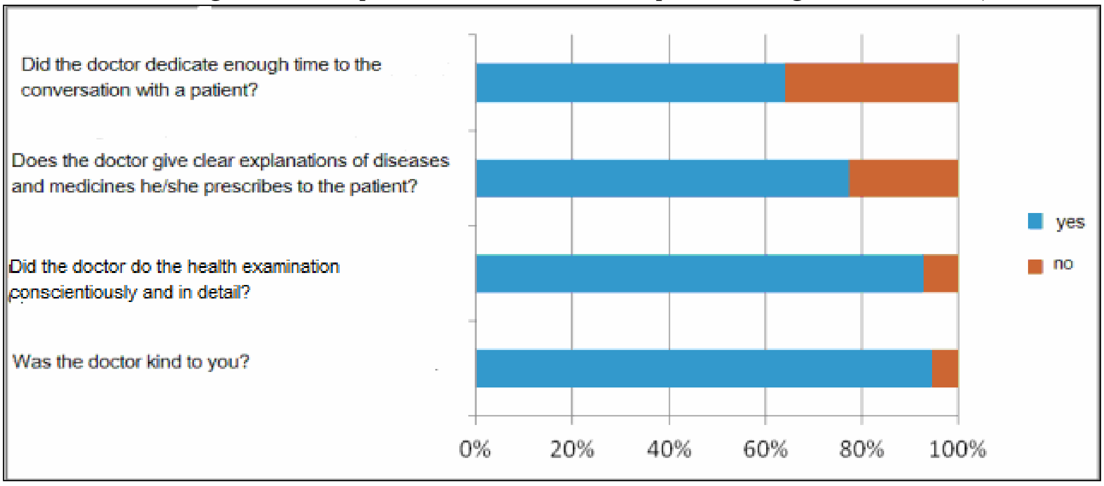
Figure 2: Distribution of answers of users in percents to the questions from the element 1 (*Element 1 - Rating of waiting time for reception*)



The source: Gavrilović A., *Primena savremenog menadžmenta u ustanovama primarne zdravstvene zaštite,* Doktorska disertacija, Beograd, 2014.

To the questions from the element 1 - Rating of waiting time for reception, shown in (Figure 2), to all questions the users of health care have shown satisfaction with received service.

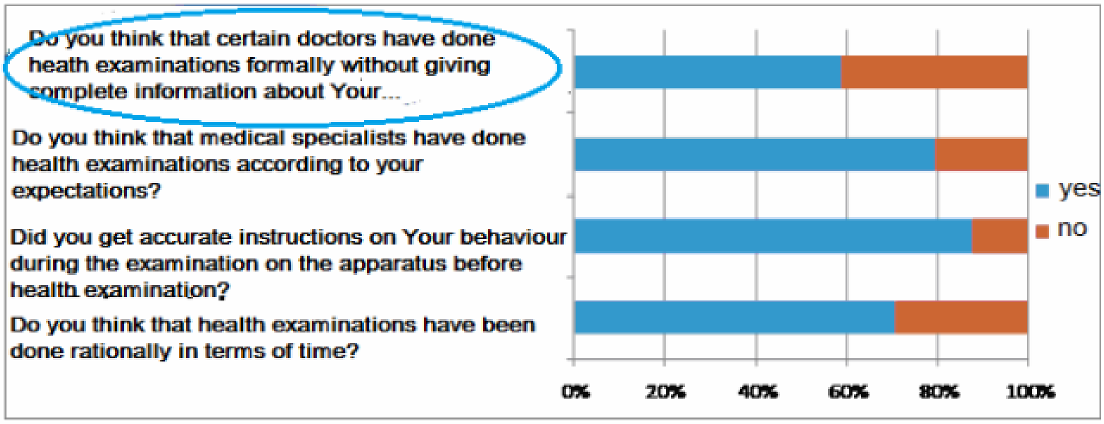
Figure 3: Distribution of answers of the users in percents to the questions from the element 2 (Element 2 - Rating of medical specialist's attitude toward a patient during the examination)



The source: Gavrilović A., *Primena savremenog menadžmenta u ustanovama primarne zdravstvene zaštite,* Doktorska disertacija, Beograd, 2014.

To the questions from the element 2 - Rating of the medical specialist's attitude toward the patient during the examination, shown in (Figure 3), the users of health care have shown satisfaction with the doctor's attitude toward the users of health services, where over 90% of respondents have answered positively to the question about doctor's kindness during the examination.

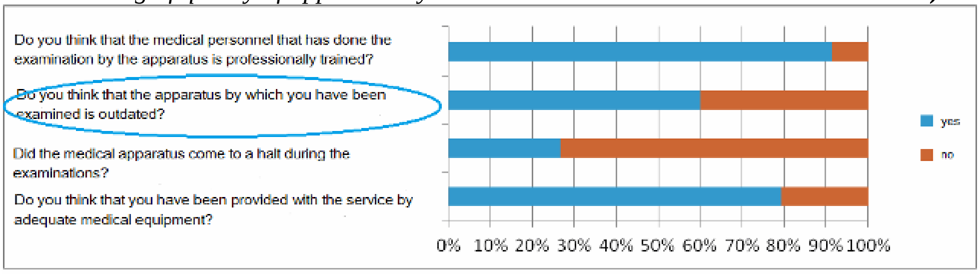
Figure 4: Distribution of answers of the users in percents to the questions from the element 3 (*Element 3 - Rating of the quality of medical examination*)



The source: Gavrilović A., *Primena savremenog menadžmenta u ustanovama primarne zdravstvene zaštite,* Doktorska disertacija, Beograd, 2014.

To the questions about the Rating of quality of medical examination from the element 3 (Figure 4), the users have shown satisfaction with received service, except to the question: "Have certain doctors done medical examinations formally without complete informing on health condition of the patient?", where 58.8% have answered that the examinations have been done formally without sufficient necessary information on health condition of the patient.

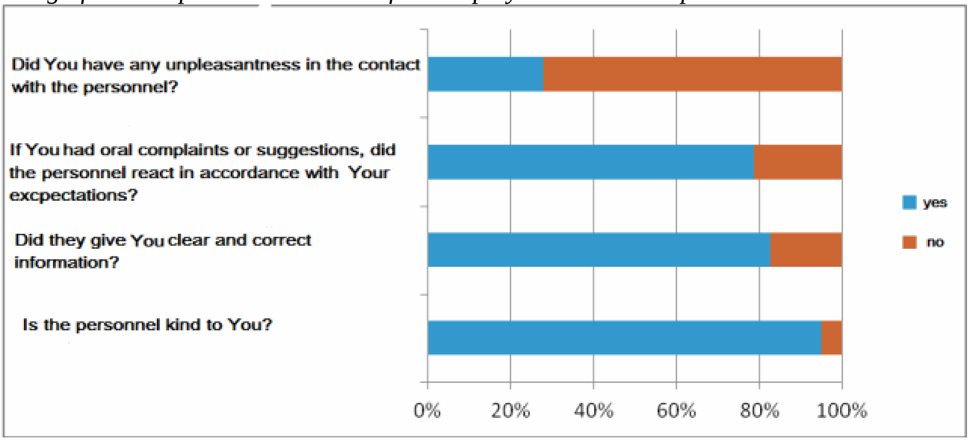
Figure 5: Distribution of answers of the users in percents to the questions from the element 4 **(***Element 4 - Rating of quality of apparatus by which the medical examination has been done***)**



The source: Gavrilović A., *Primena savremenog menadžmenta u ustanovama primarne zdravstvene zaštite,* Doktorska disertacija, Beograd, 2014.

To most questions from the element 4 - Rating of quality of apparatus by which the medical examination has been done (Figure 4), the users have given positive judgement, except to the question about obsolescence of apparatus by which they have been examined, where 60% of the respondents believe that the examinations have been done by outdated apparatus.

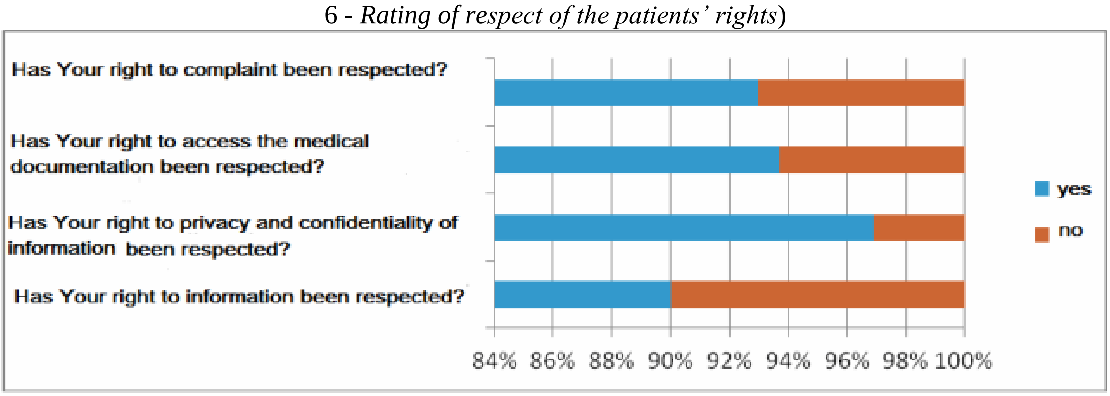
Figure 6: Distribution of answers of users in percents to the questions from the element 5 (*Element 5 - Rating of the reception and attitude of the employees toward the patient in the Health care centre*)



The source: Gavrilović A., *Primena savremenog menadžmenta u ustanovama primarne zdravstvene zaštite,* Doktorska disertacija, Beograd, 2014.

In the answers from the element 5 - Rating of the reception and attitude of the employees toward the patient in the Health care centre (Figure 6), the users have shown absolute satisfaction with the reception and the attitude of the employees toward the patient.

Figure 7: Distribution of answers of the users in percents to the questions from the element 6 (Element 6 - *Rating of respect of the patients' rights*)



The source: Gavrilović A., *Primena savremenog menadžmenta u ustanovama primarne zdravstvene zaštite,* Doktorska disertacija, Beograd, 2014.

In answering the questions from the element 6 - Rating of respect of patients' rights (Figure 7), the respondents believe that the rights of the patients have been respected completely.

4.3. Confirmations of the hypotheses

General hypothesis 0: The results obtained in the research confirm the General hypothesis 0 that respecting the principles of modern management and its application in the institutions of primary health care reduces the dissatisfaction of both givers and users of health services and it successfully fills and compensates for the lack of adequate apparatus or outdated technology for preventive diagnostics, as necessary work tools, etc.

Auxiliary hypothesis 1 which says that the quality of provided health service is significantly influenced by the application of the modern management system, work standardization with the patients, good communication, kindness of health workers and team work, as crucial basis for good organization of work and quality of delivered health service, is confirmed, which indicates the importance of development of communication and good cooperation among health workers, as well as the organizing into teams that will successfully overcome difficult professional and human tasks and challenges.

Auxiliary hypothesis 2 says that the managers of health institutions have positive attitude toward the improvement of quality in providing health services toward the patients, toward continuous medical education (specialization) and increasing the quality and professionalism in the work of health workers that significantly influence on providing high-quality service toward the users of health services (patients), which has been confirmed in the research, and the hypothesis has been proved and it is the key factor for high-quality functioning and expressed satisfaction with received service by the users of health services.

Auxiliary hypothesis 3 which says that the motivation of the employed health workers, in terms of the income they earn, for the job they perform and possibility of professional development, significantly influence on the attitude toward the users of health service, as well as the quality of provided service, *has not been confirmed*. Even 74.7% of health workers have shown the dissatisfaction of the earned income, and in contrast, 95.0% of users of health services have answered that they are satisfied with the attitude of health workers employed in health care centres which proves that the hypothesis *has not been confirmed*.

4.4. Concrete proposal of actions for better functioning of Primary Health Care in the Republic of Serbia

Table 1. Current state of functioning in the Primary Health Care and concrete proposals for improvement of functioning of Health Care Centres and PHC.

Current state (identified problem) in PHC(Primary Health Care)	**Concrete proposals for improvement of functioning of Health care centres and PHC**
1. The Health Care Centres (in PHC) are mainly engaged in cure - treatment.	1. Organize special dispensary for the prevention of disease. Put the emphasis on preventing the disease, and not only to treat it.
2. Modern apparatus and techniques for diagnostics and treatment miss - the lack of means.	2. Organize obligatory physical examinations of all systems of organs on six-month level in order to prevent or early diagnose the disease - in case of unresponsiveness and the disease occurs, the treatment is paid from their own pockets, and these will be additional means for purchase of modern apparatus and equipment for diagnostics and treatment.
3. Large crowds and long waiting for the chosen doctor's examination	3. Organize separate medical infirmaries and personnel that would treat the population of pensioners and would write the prescriptions for regular therapy.

4. The examinations are scheduled with the chosen doctor. Scheduled time is not respected, and acutely ill person (often with high fever and pain) often waits for hours when he/she will fall between the scheduled users that usually come for regular monthly therapy.	4. Abolish the appointments with the chosen doctor - nobody knows when he/she will be ill so as to schedule the examination just then
5. For each additional examination the doctor issues the referral and the patient goes to the chosen institution to schedule the examination. When the specialist does the examination, he/she writes the opinion on the report, and the patient must schedule the examination again at the chosen doctor so as to bring the report and opinion (a patient waits for the scheduling several days).	5. Improve HIS (Health Information System) and open electronic patient record - in the interests of effectiveness in the treatment and direct pooling of information and reports into the e-record - unnecessary arrivals would be avoided, waiting for the scheduling only for delivering of reports and the course of treatment will be accelerated.
6. For additional opinion of a specialist, the chosen doctor only writes a referral, and a patient must schedule the examination in the stated institution. He/she waits for it for several weeks and with a wish to solve his/her acute problem as soon as possible, he/she must contrive and often offer treat (bribe) a person who schedules the examinations, which leads us to the problem of bribery and corruption.	6. Chosen doctor directly schedules all necessary additional examinations with specialist service to which the patient is referred, whereby the creation of waiting lists is avoided because of inserting of witty patients out of turn and it prevents the problem of bribery and corruption.
7. For certain health problems that would be successfully treated at home, with increased supervision of health workers (the arrival in visit at patient's house), a chosen doctor mainly refers to hospitalization in secondary health care, because there is not sufficient number of personnel for achieving the quality of work of home care service and home treatment.	7. Increase the number of employed health workers in home care service of home treatment, with increased supervision of a doctor, whereby the means of hospitalization will be saved in hospitals for pathological states which will successfully be treated in the comfort of one's own house with the high quality supervision of health personnel.
8. Financial means for improvement of business miss, as well as modern equipment and apparatus for diagnostics and treatment. Cooperation with local community and engagement in collecting of additional means for improvement of business is insufficient.	8. Obtain funds for purchase of equipment, modern apparatus for diagnostics and technical equipment in health care centre through the cooperation with local community (provide additional health services, training, educational seminars to the institutions, business entities, as well as private companies and in that way come to the additional financial means).
9. Not all Health care centres are included in DILS program - Provision of improved services on local level" in the area of health care, education and social care on local level, (DILS - Delivery of Improved Local Services) is financed from the World Bank loan and at the same time it is implemented by three Ministries - Ministry of Education and Science, Ministry of Health and Ministry of Labour and Social policy, in the period from the beginning of 2009 to the end of 2012. Total value of loans is 32 million euros, of which the Ministry of Education and Science will use about 12 million euros for realization of project goals.	9. Apply for obtaining of the means for projects intended for the improvement of functioning of health system on local level by the World Bank, the European Union, etc.

10. Programs and engagement in earning additional financial means are poor. There is no agreement in any Health care centre on implementation of health tourism on local level.	10. Establish partnership with local tourist organization for performing the service of health tourism and in that way obtain additional funding for improvement of health organization (bring the organized group of health tourists which would solve their dental problems in dental service of a local health care centre and they would pay for that far less than in their country and health care centre would get the means for business improvement).
11. There is almost no financial incentives for work of health workers, whereby the factor of motivation is completely neglected as a significant for good functioning of work.	11. Introduce significantly large monetary incentives for health workers that have tried to perform their work duties well, as well as disincentives for negligent and poor performing of assignments.
12. There are few private-public partnership agreements with the institutions of PHC.	12. Use the possibilities of establishing private-public partnership for exchanging of services with organizations that are really interested in the same (health services for the service of roof repairs, whitewashing, replacement of tiles in offices, electrical installations, etc.).
13. Complaints of users of health services are frequent and refer to the fact that a doctor uses little time for a concrete examination of a patient, and a lot of time on typing of reports and work on a computer.	13. Organize the training for more successful and efficient work of health personnel on the computers because of the speed of using the same, so as to spend less time for data entry and more on examination of patients and providing the health services.
14. Establishment of communication is neglected in the very collective with the aim of establishing positive working atmosphere and identifying good relationships among the members of the collective that would belong or constitute good working teams.	14. Organize occasional collective gatherings so as to establish better communication and insight, by the management of the institution, into the connection between the members of the collective, for easier selection of people that will function well in teams.

The source: Gavrilović A., *Primena savremenog menadžmenta u ustanovama primarne zdravstvene zaštite,* Doktorska disertacija, Beograd, 2014.

5. Conclusion

In a difficult times of general-social and economic crisis, the health care system is under the scrutiny of professional public and the individual critics, so the research precisely in this area has been imposed as a need and necessary solution, whereby the claims that cause unfounded or founded disapprovals would be at least partially confirmed or rejected. The paper researches whether the health system is, with all its weight of accompanying social-economic circumstances, successful in providing the health services, thanks to good business organization, through the research and the analysis of satisfaction of users and givers of health services, in the institutions of primary health care, which are the winners of awards for quality improvement and application of modern management.

General conclusion of this research is that in such difficult and turbulent times of financial, political and economic crisis the health system of Serbia meets set requirements successfully, at least in this part that has been treated in this research, and that is the primary health care. Reckless speculations about a poor quality of service in health care centres have not been confirmed, because the users of health services in both health care centres have shown the satisfaction in most tested categories. The satisfaction with the work of the tested health workers has also been proved, with the possibility left for better business organization. Which leads us to the conclusion that by a good business organization, with the application of tools and techniques of modern management, in other parts of the health system of Serbia as well, the effect of satisfaction with the received service by the users would be achieved, as it is seen in the example of these two health care centres. The quality in both health care centres is measurable through the quality of provided health service, which has been measured in this research by the satisfaction of giver and receiver of the same.

In the research on the satisfaction of users of health services and the employed health workers in Health care centres Voždovac and Palilula, as well as in the Table "Average rating of satisfaction of users", the above-mentioned ascertainment has been confirmed that the users of health services are generally satisfied with the quality of health service, received in the institutions of primary health care, whereby it is concluded that in the circumstances of economic crisis and financial deficit, lack of means for health care, reduced number of health personnel, good business organization and application of the principles and procedures of modern management lead to optimal and satisfying functioning of the health system of Serbia on the primary level.

Primary health care is integral, permanent and comprehensive part of formal system of health care in all states, and/or it is considered as the means by which two basic goals of health care system are balanced - optimization and balance in the distribution of health services through the system of high-quality health management. It is recognized as a potential solution in functioning of the health care system with the need of shifting the focus on the preventive, and/or taking over of 80% of total health services that should be provided in the primary health care. So the theme of this paper is exclusively current and necessary so as to determine the level of application of modern management in the institutions of primary health care, as well as to start the processes toward the raising the level of the same. New course of changes in economic flows and economic situation in the state greatly influences on functioning and financing of the health system. In the situation when a large number of employers avoids to pay into the compulsory health insurance fund, and the deficit is subsidized by the budgetary funds, it suggests the conclusion about the difficulty of sustainability of such an organized health system, so this paper is a sort of impulse in the need of solving the problems through a new way of organization with the emphasis on the control. Use the identified strategies of change to the maximum, with careful use of the resources, with the fortitude of collective efforts, with including of the employed in the decision making and incitement of team work, as well as group resolving of problems are the key to successful management in the health care.

The only possibility of going out from the crisis in the management of the health system of Serbia lies in the resources of the primary health activity, with the emphasis of its activity on the preventive and early detection of potential disease, obtaining the additional means in partnership with local community, local economic organizations, through the exchange of services, through activating and establishing private - public partnerships, as well as by the change of business organization within the very health organization, whereby the efficacy and quality of delivered service would be increased. It is necessary to pay attention to the education of health personnel, as well as to treat a health worker as the most important resource of the organization, because only such behaviour will give the expected effect, and the employed will feel the belonging to the organization and strive to its more successful and better business and they will experience it as a personal venture (Gavrilovic, 2014).

The relationship between the modern management oriented toward the health care and medical technology is in the high degree of correlation. It means that health managers and experienced medical personnel, to whom the organizational and administrative function is entrusted, must be one team with the mutual goal of development of health institutions and health services. Functioning of health institutions has got its limits and restrictions in the way and volume of financing of total needs of modern and efficient system of health care. Health management can improve the system of work and business in a good part from the standpoint of efficacy and effectiveness, but it can not improve the technology of health services in all areas of medicine without its modernization and purchase of modern apparatus and devices.

The improvement of management in the health care, especially in the part of support and use of highly qualified staff from the area of management, presents the instrument for improvement of organizing, functioning and business of health institutions, but also the instrument for efficient transfer of technology and knowledge. Taking into account the fact that the health care is in a number of countries, as well as in the Republic of Serbia, the branch with high degree of government regulation, the space opens for numerous high-quality entrepreneurial initiatives, which will be in the function of improvement of health system and greater access of contemporary medical procedures, equipment, materials and human resources. For us, it represents one of the basic strategic goals and priorities. As the key determinant of the development and improvement of health system, it should be emphasized that in the position of decision makers in the area of health policy should be the people who would be capable for recognizing the problem as a whole and for development and strategic thinking, that on the level of management of health institutions should be managers and leaders capable for efficient management of limited resources and to introduce the changes practically into the way of functioning and internal reorganization of the system of providing health services.

Of the great importance is the work on recognizing, accepting and promotion of health management as a profession. By focusing the attention to the formation of professional capacities, strengthening of management skills and capabilities, as well as using positive examples and experiences so-called the best practice, especially from developed states, a whole health system gets the opportunity to be modernized and improved (Mitrović and Gavrilović, 2013). Health represents one of the most important prerequisites for the high-quality life of the population and it must be recognized as the priority of the development strategy of health care. The health of the population of Serbia is of key interest for the state and it is the most important item of its accelerated political and economic development. Health policy should represent the basis for legislative, program and action programs, with the goal of making the health care more efficient and high-quality, and including the health system into European and world process of health development (Gavrilovic et al., 2013). The problems of this system can cause significant negative financial consequences for the citizens and their families. Medical science, and along with her the costs of treatment and prevention, increase faster than the increase of economic basis of the society. Therefore, it is necessary to introduce adequate forms of financing of the health care which will ensure the access to necessary health care, and at the same time, it will distribute the financial risk, so that the citizens are not significantly financially threatened in the case of disease. By the planned restructuring of existing resources, significant improvement of health care can be achieved. For true improvement of health outcome and healthcare services, health care should be integrative, and health should become "a joint venture" (Stambolovic, 2008).

In the end, this short factual observation will show that functioning of our health system is not as bad as it is labelled by many: "1.200.000 people in Serbia do not work, do not have incomes and do not pay health insurance, but they are entitled to health care from the joint budget. The most sensitive categories of the population belong to this category. Average salary in Serbia is 30.000 dinars, which means that average allocation for health insurance per the employee is 6000 dinars a month, whereby he/she will cover health insurance for himself/herself and the members of his/her family. For his/her whole lifetime an average employee allocates about 2.5 million dinars. This amount hardly covers the costs of treatment of diabetes, it may cover the costs for a year of dialysis or half a year of treatment of leukaemia and other oncology diseases, and a person suffering from haemophilia would not cover his/her costs of treatment for ten lives.

Yet in Serbia, unlike America, no one has been left without the insulin, dialysis or medicines for haemophilia, and the ambulance does not have the right to reject anyone if he/she does not have the health insurance. An average American earns 1500 dollars. 160 dollars are allocated for the basic package of health insurance, which does not cover the costs of health care of family members nor does it provide the coverage for more serious and more expensive diseases. Insurance that provides full coverage costs 100 dollars a month and it is not available to everyone. Average German earns 2500 euros. He/she allocates about 500 euros for health insurance. The state covers health care for social categories, but in Germany only seven percent of able-bodied population do not work. The message is that for ten times less money per capita than Slovenia and 30 times less than Canada or France, we can not expect excellent comfort (Vukajilovic, 2014).

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Finansijska pozicija mađarskih poljoprivrednih preduzeća pre, za vreme i posle globalne finansijske krize

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Apstrakt: Cilj našeg istraživanja bio je utvrđivanje uticaja globalne finansijske krize na operativnu profitabilnost mađarskih poljoprivrednih preduzeća, putem istraživanja fluktuacija u kreditiranju, neto investicijama i neto prodaji. Na osnovu istraživanja sprovedenih u Srednjoj Evropi analizirali smo finansijsku poziciju preduzeća u periodu od 2007. do 2013. godine, svrstavajući ih u grupe prema njihovoj veličini i tražeći veze između pokazatelja promenjenih usled finansijske krize. Na osnovu sprovedenih istraživanja došli smo do konkluzije da je kriza bila najizrazitija u 2009. i 2010. poslovnoj godini; mikro i mala preduzeća su u ovom vremenskom periodu bila posebno izložena nepovoljnim uticajima. Posebnim testiranjem parametara modelom regresije koji objašnjavaju promene u operativnom profitu dokazano je da gore spomenute promene nisu bile nezavisne jedni od drugih. Jedna model analiza svedoči o uzročno-posledičnoj vezi između pada operativnog profita (EBIT) i smanjenja prihoda iz neto prodaje u 2009. godini, kao i o vezi između naglog povećanja istog i rasta prihoda iz neto prodaje u 2011. godini, osim toga i o marginalnom efektu neto investicija.

Ključne reči: finansijska kriza, profitabilnost, poljoprivredna preduzeća.

Financial position of Hungarian agricultural companies before, during, and after the global financial crisis

Abstract: The objective of our research is to describe how the financial crisis affected the operational profitability of Hungarian companies in the agricultural sector through fluctuations in lending, net investments, and net sales. Based on research conducted in Central Europe, we analyze the financial position of companies, clustered by their size, between 2007 and 2013, seeking relations between the indicators that changed as a result of the crisis. As a conclusion, we identify 2009 and 2010 as the business years that were affected by the crisis the most; in this period micro- and small-sized companies were particularly exposed to adverse changes. Separate testing of the parameters of regression models explaining the changes in operating profit demonstrates that the above changes were not independent of each other. An analysis of the models evidences a causal nexus between the fall in operating profit (EBIT) in 2009 and the decrease in net sales revenue as well as between the outlier increase in the same in 2011 and the growth of net sales revenue and the strong marginal effect of net investments.

Keywords: financial crisis, profitability, agricultural companies

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1. Introduction

The performance, financial condition, and profitability of agriculture are often subjects of research, as the products of agro-industry contribute to the satisfaction of basic human needs, either through direct consumption or after being processed by the food industry. Hence, a period that affects agriculture adversely may have severe consequences for the world's food supply and the accessibility of agricultural products at a moderate price. This impact may influence both net importers and net exporters of agricultural products. Due to the low level of self-supply, the former depends on international trade; therefore, any breakdown of the trade may impede the supply of these vital products. Based on the analysis of long time series of the trading of agricultural products within the EU, among the EU-28 Greece, Spain, the United Kingdom, and France may qualify as net importer countries. Conversely, the positions of net exporters may be affected by changes in exchange rates and demand. Germany and the Netherlands are significant net exporters in the EU-28, but Hungary belongs to this group as well (European Commission, 2017).

2. Literature review

The performance of agriculture has been the subject of much research (governed by widely differing goals) in recent years. Some authors have devoted their works expressly to the exploration of the impacts of the crisis, others have obtained results that could easily be connected to the crisis in the course of the accomplishment of other research objectives, while some authors have revealed and published certain factors that might have mitigated the impacts of the crisis. Examples of the latter are analyses that have focused on the examination of changes in the condition of agriculture in those countries that joined the EU in 2004. The two most significant of these changes were the boom in the international trade of agricultural products and the direct payments of the Common Agricultural Policy (Bašek & Kraus, 2009; Chrastinová & Burianová, 2009; Střeleček et al., 2009; Svatoš & Smutka, 2010).

Bašek and Kraus (2009) revealed a significant increase in the Czech agricultural exports and imports in the period between 2005 and 2007 compared with the period between 2001 and 2003. Moreover, there was a moderate improvement in the indicator of counterbalancing imports by exports, though the country’s exports seemed to be rather one-sided: more than 70% of the exports were expedited to three countries.

Svatoš and Smutka (2010) established from their analysis of data related to the agricultural product exports of Austria, the Czech Republic, and Hungary between 1999 and 2008 that the share of exports to and imports from the EU countries increased within the total volume of agricultural exports/imports. Furthermore, the rate of growth of exports was significantly higher both in the Czech Republic and in Hungary after 2004 than before this date. Czech agricultural exports increased by 15% between 2004 and 2008, while their rate of growth between 1999 and 2003 was only 3%. The same values for Hungarian agro-exports were 11% growth and a 1% decrease. The authors identified the above phenomenon as a structural change in exports, namely a quality shift toward processed products.

Concerning Hungary, Kiss (2008) also underlined the importance of trade with the EU countries: she demonstrated a rocketing increase in the share of the EU-24 in both the export and the import trade volume of Hungary.

Among the impacts of the crisis on agriculture, Kirkegaard (2011) highlighted that the decrease in incomes might have reduced the demand for agricultural products. Lending distrust raised difficulties in the financing of agricultural activities. Exchange rate fluctuations changed the competitiveness of the countries’ products on the international market. As a result of budget deficits and the increase in the value of public debts, the volume of state subsidies must have fallen (this statement is also applicable to direct EU payments).

Lending was a problem in the agro-industry of Ukraine as well. Oliynyk et al. (2014) revealed that Ukrainian agriculture is rather underfinanced. Compared with the weight of the sector in the country’s export volume (20%), the total share of the same in loans was a slender 5.9% in 2011. The consequences of the crisis for Ukrainian agriculture became perceivable from 2009: in this year the so far dynamic growth of the bank loan portfolios of agricultural companies dropped drastically. The share of the sector in the total bank loan volume fell from 6.5% (2008) to 5.3% (2010). Moreover, the share of preferential loans within the total loan portfolio dropped to 14% in 2010 from 75% in 2008. Taking out loans became more difficult, though the output of agriculture in Ukraine between 2004 and 2013 was an exponentially increasing function of the bank loans provided for the sector (Oliynyk, 2016).

3. Data and methodology

The research investigates the financial statements of Hungarian agricultural companies between 2007 and 2013, a period that is long enough to present a distinct picture of the impacts of the crisis. The data for the research was provided by the Amadeus Database, which collects data of business entities maintaining a double-entry bookkeeping system all over Europe. We obtained the data of 8938 companies, of which we composed a sample consisting of 1277 elements. Concerning the selected companies, all the data essential for the research were wholly available for each year of the investigated period.

We cluster the companies of the sample based on their size[4]. Clustering allows us to detect whether the size of a company is a quality criterion determining the impacts that it experienced from the crisis.

We describe the financial status of the average company of the sample as well as of the average company of each of the four clusters[5]using various indicators, the earliest of which serves as base data. The indicators are produced to each year as the arithmetic mean of the respective data of companies, and their unit of measurement is thousand HUF. Thus, the value of indicator "i" in the base period is:

$$indicator_i = \frac{\sum_{j=1}^{N} X_{ij}}{N} \tag{1}$$

where “i” denotes the i-th indicator, “j” the j-th company, N the number of companies and Xij the value of indicator "i" for company "j".

Size-based clustering generates big absolute differences; hence, focusing on the relative changes, we constitute indices from indicators on the level of the average company as well as on the level of clusters. Therefore, the index attached to indicator "i" in the year "t" is:

$$index_{it} = \frac{indicator_{it}}{indicator_{i,baseperiod}} * 100 \tag{2}$$

where t = 2007; 2008; ... 2013, indicating the year, and $indicator_{it}$ is the average of the indicator "i" in the period "t" while $indicator_{i,\text{base period}}$ is the average of indicator “i” in the base period.

We define the possible scope of the indicators concerning the possible impacts of the crisis. We examine the fall in lending activity through the changes in the indicator of short-term loans,[6] the eventual difficulties in the renewal of assets through the changes in net investments, and the impacts on revenues and exchange rates through the net sales revenue. The latter - together with changes in costs/expenses - affected the operating profit, which is also a subject of this research.

For further analyzes, the research uses the methods of descriptive statistics and correlation and regression analysis, executed by Microsoft Excel and the Gretl for Windows econometric program.

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[4]Some authors have already assessed the members of agro-industry clustered on various criteria, like geographical location (Steklá et al., 2015) and the quality of the land cultivated (Střeleček et al., 2012). Clustering on size - based on total assets and net sales revenue of companies - could turn out to be more useful in this case, since some size-related factors, like financial standing, credit rating, and liquidity, may be decisive in a crisis-affected period.
[5]Micro, small-sized, medium-sized, and large companies.
[6]The weight of long-term liabilities is not determining in the average enterprise of the sample; hence, we focus on short-term loans only.

4. Hypotheses

Knowing the characteristics of the crisis and the trends presented in the neighboring countries, we establish the following hypotheses concerning Hungary, relying on the clustering of the companies of the sample as described in the previous part.

H (1): The credit crunch, identified by Kirkegaard (2011) as a potential impact of the crisis, caused the most substantial reduction in the volume of short-term loans provided for micro- and small-sized companies, which usually have a weaker credit rating.

H (2): As an implication of the crisis, difficulties in financing resulted in a decrease in net investments.

H (3): The slackening demand for agricultural products, evoked by the decrease in incomes, diminished primarily the net sales revenues of the smallest, micro-sized companies, which have limited access to foreign markets.

H (4): Falling revenues and changes in the cost structure jointly resulted in a decrease in the operating profit: in the years of crisis their amount became unpredictable at the same time.

H (5): The changes described in the hypotheses are not independent of each other; specifically, the simultaneous existence of H (1), H (2), and H (3) contributed to the emergence of H (4).

5. Results

As a result of clustering (as described above), the number of companies belonging to the individual clusters was the following:

Table 1: Number of companies in the single clusters (pc)

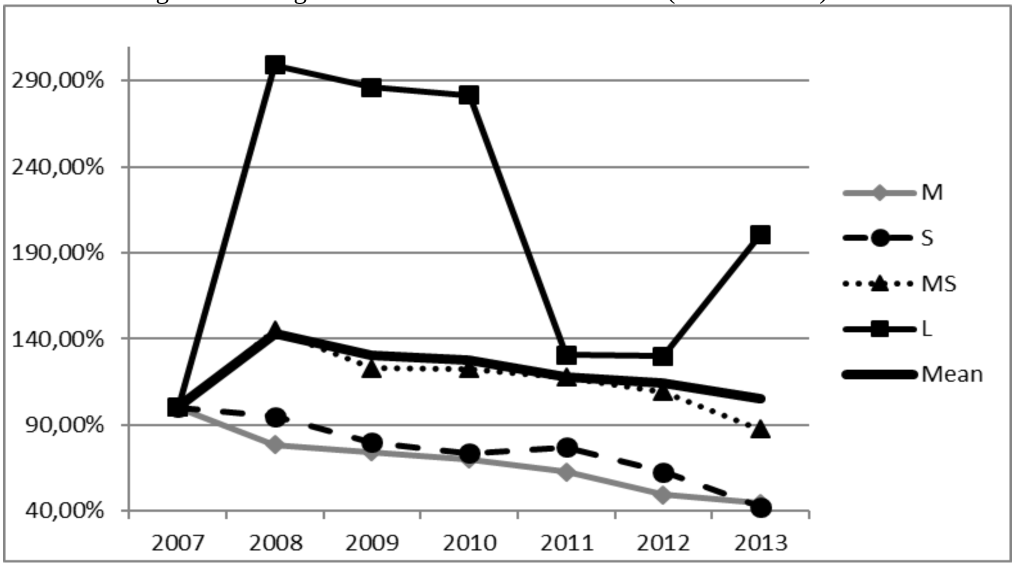
(pc)	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Micro (M)	1084	1066	1058	1056	1032	1015	999
Small (S)	166	178	183	183	204	213	222
Medium-sized (MS)	24	30	33	35	38	46	53
Large (L)	3	3	3	3	3	3	3

Source: own calculations

This gives a favorable account of the status of the sector, showing a steady expansion in the number of small- and medium-sized companies and a drop in the number of micro-sized companies. As the clustering is based on the assets and turnover of companies, in many cases the change in these indicators allowed companies to "switch level".

The changes in the volumes of short-term loans give a significantly less favorable account of the sector.

Figure 1: Changes in short-term loans and credits (2007 = 100%)



Source: own calculations based on Amadeus data

The change in an average company's graph after 2008 evidences the pervasive presence of the credit crunch in Hungarian agriculture: after the outbreak of the crisis, these items appeared in the balance sheet of an average agricultural company to a decreasing extent (-5.3% per year). This result corresponds to the findings of Széles et al. (2014). The drastic raising of the Hungarian National Bank's base rate by 300 percentage points in October 2008, must also have played a role in the above process (MNB, 2017).

Except for large companies, all the members of the sample had to face rather severe difficulties in short-term financing, similar to the phenomenon occurring in Ukrainian agriculture (Oliynyk et al., 2014).

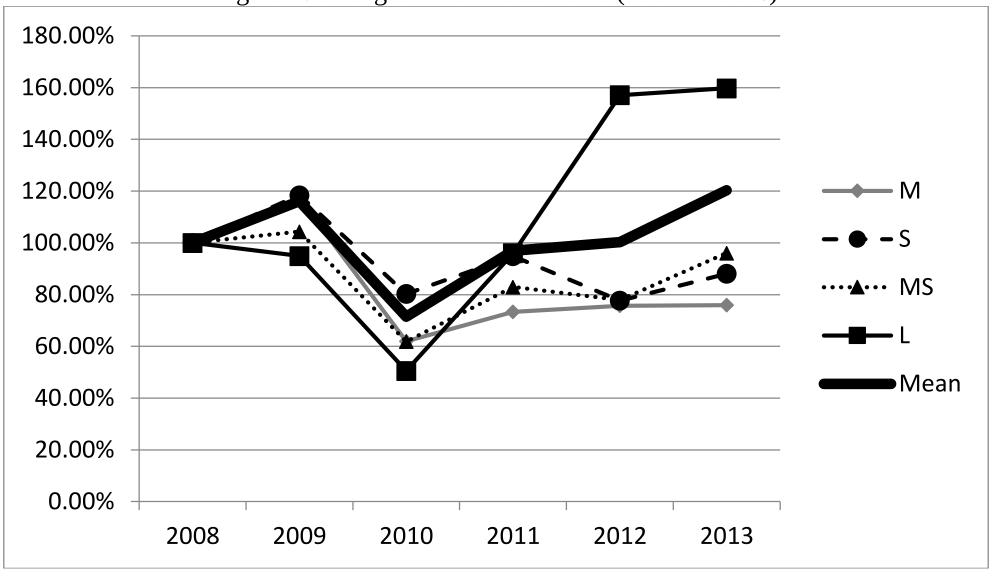
From the available accounting data, we approximate the changes in net investments with equation (3):

$$Net\ investment = Closing\ value - Opening\ value + Depreciation \qquad (3)$$

(3) gives the difference between the value of purchased, self-manufactured assets and the value of sales realized in the subjected year concerning fixed assets, thereby providing an overview of the renewal of asset stocks. The results are positive year by year, meaning an active asset renewal on the level of the sample average in each year. Only the dynamics of investment activity changed in time: the first adverse change occurred in 2010 when the respective value of the average company fell by 31.7%.

However, the drop in investment activity did not turn out to be permanent: after 2010 the volume of net investments started growing continuously. Mainly the large companies accounted for this progress, as their credit rating allowed them to find sources for financing their investment projects rather easily. The net investments of the companies in other clusters did not reach the volume of the base period in the second half of the examined period.

Figure 2: Changes in net investments (2008 = 100%)



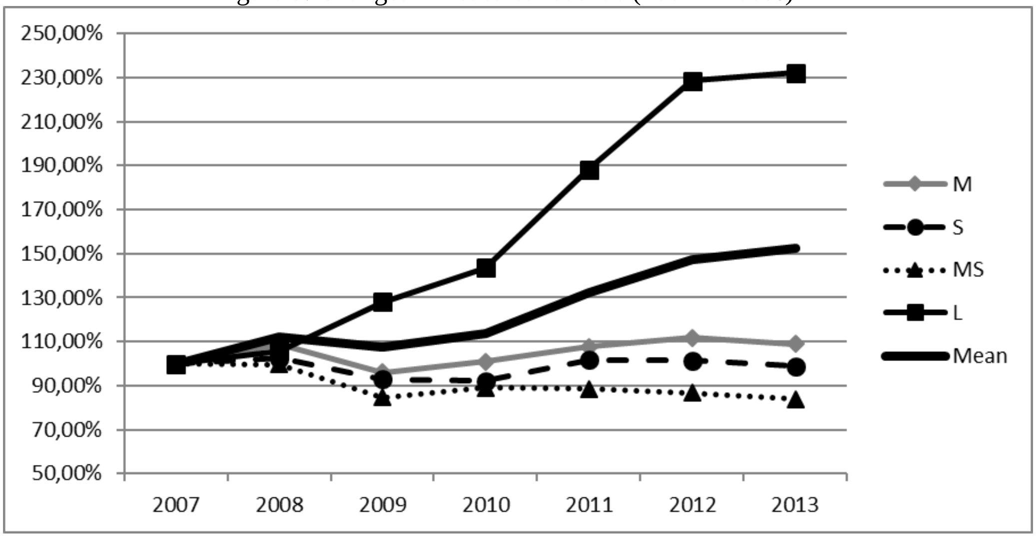
Source: own calculations based on Amadeus data

In this respect neither the relative nor the absolute arrear of micro-sized companies is substantial compared with the average, meaning that these companies also managed to find sources, other than bank loans and credit, to finance their investments.

Regarding the trends of the net sales revenue, we must note in advance that the Hungarian forint depreciated materially against the main currencies in the examined period,[7] which increased the competitiveness of Hungarian products on the international agricultural goods' market. As a result of this, the agro-exports of Hungary were able to grow each year (except for 2009 and 2012), thereby contributing to the surplus of the external trade balance (KSH, 2016). The good performance of exports compensated for the slackening domestic demand for agricultural products resulting from the fact that the economic growth in Hungary remained under 2.1% during the whole term of the investigated period and the economic decline was 6.6% in 2009 and 1.6% in 2012 (MNB, 2017). Hence, in total the average net sales revenue started to grow from 2010 (following a temporary fall in 2009) by 10.4% yearly. Also, in this case, large companies played a leading role in the growth; the stagnation of the revenues of other companies was due to their lack of export orientation. Medium-sized companies were affected the most by this phenomenon: the value of their net sales revenues became stuck on the level of 90% of the base period throughout the years following 2009.

[7]The EUR/HUF exchange rate increased from 251 (2007.01.02) to 297 (2013.12.31) (MNB, 2017)

Figure 3: Changes in net sales revenue (2007 = 100%)

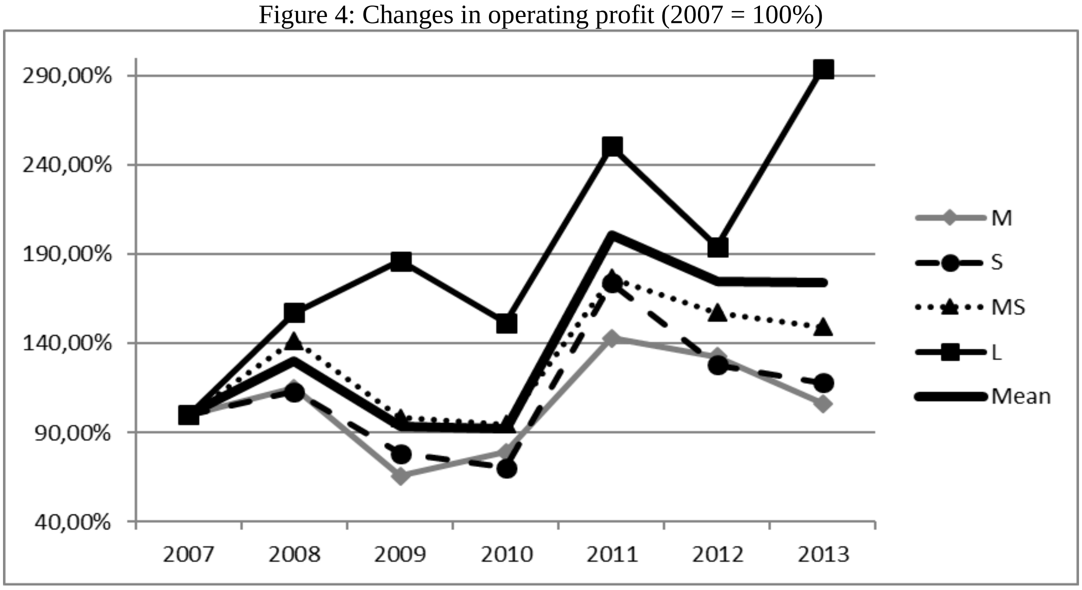


Source: own calculations based on Amadeus data

In general, the trend of the net sales revenue is rather positive. The main reason for this could be the growth of agricultural exports after the accession to the EU, which is not a unique phenomenon: the same progress can be observed in the countries that joined the EU in 2004 (Bašek & Kraus, 2009; Svatoš & Smutka, 2010).

We must also note here that the respective data of the base period (2007) are positive, meaning that, on the operating level, the average companies of each cluster were able to produce profit in all of the investigated years.

Figure 4: Changes in operating profit (2007 = 100%)



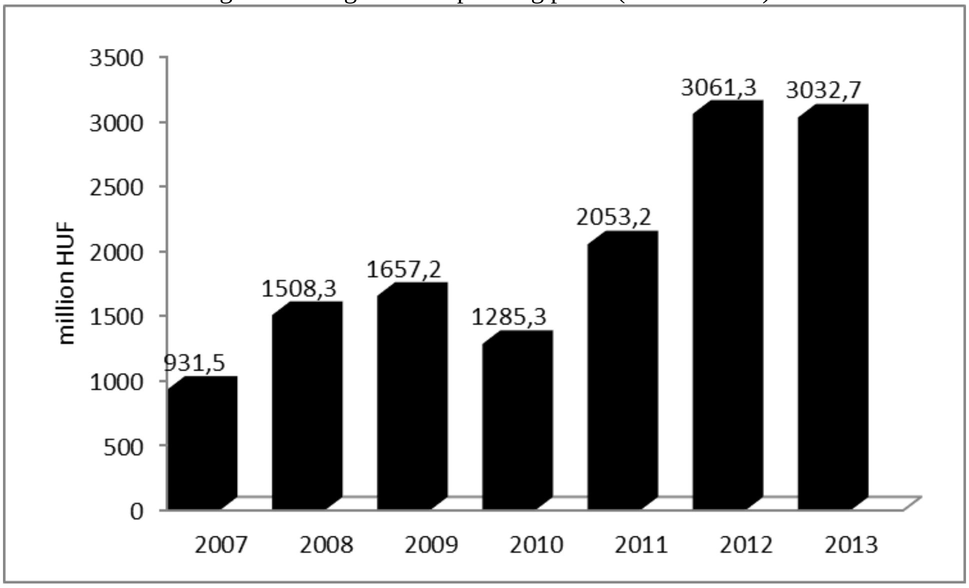
Source: own calculations based on Amadeus data

This indicator suffered a severe setback in 2009, which continued in 2010 as well, demonstrating an unfavorable relation between the trends of the changes in the net sales revenue and the costs in these two years. This is in line with the result of Aulová et al. (2013).

This tendency shifted back in 2011 when the operation of companies became more efficient. The same did not apply, however, to 2012, when the growth of the net sales revenue was followed by a significant decrease in the operating profit.

The figure below demonstrates the range[8] of the operating profit in each year making its variability clear:

Figure 5: Range of the operating profit (million HUF)



Source: own calculations based on Amadeus data

The range of the sample broadened significantly in 2008, and the same tendency applied to 2009. That is to say that the difference between the maximum and the minimum operating profit continued to grow in the crisis period.

Examining the clustered sample, we may establish that the values of medium-sized companies represent the approximate average of the sample. Based on the analysis of the graphs, the values of large companies show a weak correlation with the data of the other three clusters, the tendencies of which are rather correspondent with each other. This fact also demonstrates the outlier nature of large companies; hence, from the point of view of the sample, the values of the other three categories are relevant.

The results so far suggest the existence of a relation between the analyzed variables, and we intend to clarify whether this correlation is only an accidental covariance of values or the manifestation of a statistically significant relationship.

Since the applied statistical tools are sensitive to the outlier values from now on, we disregard the three large companies of the sample and focus on the statistical relation among the values of the remaining 1274 companies to avoid biased the results (Maddala, 2004).

The following table demonstrates the value of Pearson's correlation coefficient between the operating profit (EBIT) and the three other variables in the individual years:

Table 2: Correlation matrix (***: the correlation is significant at 1% significance level)

	2008	**2009**	**2010**	**2011**	**2012**	**2013**
Net Inv. – EBIT	0.3900***	0.3958***	0.4627***	0.5576***	0.5006***	0.6714***
Loans – EBIT	0.4357***	0.5005***	0.3997***	0.5105***	0.4724***	0.5644***
Net Sales – EBIT	0.4421***	0.4726***	0.4440***	0.5413***	0.4518***	0.6511***

Source: own calculations based on Amadeus data

[8]Range = maximum value - minimum value

The positive value of the correlations means that the examined variables typically moved in the same direction. The strength of the correlation is moderate in each case. On the 1% significance level, each correlation qualifies as significant, supporting H (5).

However, as the correlation coefficient cannot be interpreted as a slope coefficient, we supplemented the correlation analysis with a linear regression calculation to reveal marginal effects.

Based on the results obtained so far, we consider that the years 2008, 2009, and 2011 deserve special attention; we apply a linear regression model to the data of these years using the variables of the previous analyses (operating profit (y) as the dependent variable and short-term loans (x_1), net investments (x_2) and net sales revenue (x_3) as independent variables) to test hypothesis H (5) again. The reasons for the selection of these years are the followings: 2009 was the year of the first shift to the unfavorable direction that ended up in the fall in the operating profit. In this regard, 2008 will serve as the base year, with which the results of 2009 will be compared. At the same time, 2009 will be the basis of comparison concerning the data of 2011 (as we demonstrated above, 2010 produced similar results to 2009).

Our intention with the linear regression analysis is to merge the linear relations that we revealed through the correlation analysis in one model as follows:

$$y = \beta_0 + \beta_1 * x_1 + \beta_2 * x_2 + \beta_3 * x_3 + \varepsilon \qquad (4)$$

The results are summarized in the following table:

Table 3: Coefficients of the regression equations and the Bootstrap confidence intervals (**: the coefficient is significant at 5% significance, i.e. the 95% Bootstrap confidence interval does not contain 0)

		2008	**2009**	**2011**
Short-term loans	Point estimation	0.137496**	0.120969	0.146898**
	95% confidence interval	(0.00678; 0.22426)	(-0.04308; 0.22965)	(0.01969; 0.25850)
Net sales revenue	Point estimation	0.0313613**	0.0215675**	0.0301202**
	95% confidence interval	(0.00818; 0.06089)	(0.00546; 0.03481)	(0.00516; 0.06392)
Net Investments	Point estimation	0.0470507	0.0542959	0.237042 **
	95% confidence interval	(-0.03165; 0.17789)	(-0.01689; 0.16325)	(0.11861; 0.38159)

Source: own calculations based on Amadeus data

We can observe that the net sales revenue has material importance for the operating profit with respect to each year, which, keeping in mind the calculation method of the operating profit, is not surprising. Less obvious is the marginal effect on the operating profit, which is rather low. Short-term loans also have a positive relationship with the operating profit; this was significant in 2008 and 2011. The value of net investments has no explanatory role in the model, with respect to 2008 and 2009, but in 2011, its coefficient shows a very strong marginal effect.

6. Conclusions

Among our hypotheses, we managed to confirm the correctness of the one related to lending (H (1)), as the volume of short-term loans decreased continuously with respect to micro- and small-sized companies. This result is consistent with the findings of Oliynyk et al., (2014) and Széles et al. (2014). Concerning the decrease, there was a significant difference between the size-based clusters: the fall was not as drastic in the case of medium-sized and large companies due to their better credit rating. The unequal distribution of loans among the companies in the sector was obviously demonstrated by the fact that the loan portfolio of large companies was almost two thousand times as large as that of micro-sized companies.

However, this circumstance did not lead to a setback in net investments during the same period and to the same extent; this proves that the inducements of investment activity are probably different from those of the short-term funds mentioned above. These investments are most likely to be financed from investment loans and subsidies. Accordingly, our hypothesis concerning net investments (H (2)) was true only with respect to 2010, since in this year the value of this indicator decreased significantly in all the clusters. The crisis impacts showed a strong correlation with the size of companies in this respect as well: the average value of net investments among the companies in the three smallest size-based clusters did not reach the level of 2008 in any of the subsequent years.

The net sales revenue of the average company fell slightly in 2009 only. Otherwise, it grew in each year (following a trend similar to that of Hungarian agricultural exports), which is related to the depreciation of the domestic currency. However, the micro-, small-, and medium-sized companies of the sample could not, or could only to a moderate extent, take advantage of this trend, probably because of the lack of export orientation. The correctness of hypothesis H (3) was not confirmed: it was not the micro- but the medium-sized companies that achieved the worst sales results; their average value was around 90% of the 2007 value after 2009.

The operating profit showed a fundamentally different pattern from the net sales revenue, highlighting changes in the cost structure. The correctness of H (4) was confirmed for 2009: in this year the operating profit decreased drastically to a much greater extent than would have been reasonable based on the fall in the net sales revenue. This result is in line with the one of Aulová et al. (2013). The size of companies turned out to be a useful clustering factor, as small- and micro-sized companies suffered the most drastic fall in net sales revenue in 2009. H (4) conceived the instability of the operating profit as well, a statement that also turned out to be correct due to its expanding range in the years of the crisis.

As a conclusion regarding these changes, we identified 2009–2010 as the business years that were affected the most by the crisis; in this period micro- and small-sized companies were particularly exposed to adverse changes. The review of the relevant literature allowed us to give an evaluation of the above-mentioned findings in an international context. In this respect Hungarian agriculture is not exceptional: the impacts of the crisis in connection with lending, sales, and profitability are observable here as well.

The correlation analysis indicated significant positive correlations of moderate strength among the studied variables.

In all the regression equations, the net sales revenue turned out to be a significant regressor. Short-term loans had a significant relationship – judged by the confidence interval of its parameters - with the operating profit in 2008 and 2011. The value of its parameter was not significantly different from zero in 2009 consequently this year the fall in the operating profit can be attributed to the termination of the positive effect of the short-term loans together with the weaker effect of net sales revenue. The net investments had significant effect only in 2011 contributing to the increase of operating profit.

The goodness of fit of the models was not particularly high (42% in 2008, 33% in 2009, and 44% in 2011) as a consequence of the scope of the study: we focused primarily on the impacts of the global financial crisis, through lending, net investments and net sales revenue on the operation-level profitability of the examined companies. As for future research, we are also interested in investigating the net income of these companies where other factors – beyond the ones investigated in this research – shall be taken into accounts such as the factors determining the financial income and the amount of corporate tax.

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Analiza konstrukcionih karakteristika automatskih pušaka domaće proizvodnje u cilju opremanja jedinica Vojske Srbije

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Apstrakt: Veličina slike rasturanja pogodaka i njena udaljenost od cilja opredeljuju stepen tačnosti i preciznosti automatske puške. Puške su bile, i još uvek su osnovno oružje pešadije, a po svojim dimenzijama i načinu rukovanja ubrajaju se u kategoriju individualnog oružja. Vrlo uspešno se upotrebljavaju za gađanje na daljinama do 400 m, odlični strelci mogu uspešno da gađaju i na daljinama do 600 m. Automatska puška je namenjena za uništavanje neprijateljske žive sile i vatrenih sredstava neprijatelja. U radu su prikazane taktičko-tehničke i borbene karakteristike automatskih pušaka domaće proizvodnje i to AP M70 AB2 7,62 mm, PA M21 5,56 mm, PAM M17 6,5 mm. Izvršena je uporedna analiza konstrukcionih karakteristika navedenih automatskih pušaka i njihove municije upotrebom softvera Expert choice i primenom AHP metode. Na osnovu dobijenih rezultata donet je zaključak o najefikasnijoj automatskoj pušci, a u cilju uvođenja u operativnu upotrebu i opremanja jedinica Vojske Srbije. Na osnovu rezultata istraživanja došlo se do zaključka da najbolje konstrukcione karakteristike poseduje puška automatska modularna M17 u kalibru 6,5 mm.

Ključne reči: analiza, konstrukcione karakteristike, automatska puška, AHP metoda

Analysis of the construction characteristics of automatic domestic production rifles for the purpose of equipping units of the Serbian Army

Abstract: The size of the scattering image and its distance from the target determine the degree of accuracy and precision of the automatic rifle. The rifles were and still are the primary weapon of the infantry, and according to their dimensions and manner of handling, they belong to the category of individual weapons. They are very successfully used for shooting at distances up to 400 m, excellent shooters can successfully shoot at distances up to 600 m. The automatic rifle is intended to destroy the enemy's live force and the enemy's firepower. The paper presents the tactical-technical and combat characteristics of automatic domestic guns, AP M70 AB2 7,62 mm, PA M21 5.56 mm, PAM M17 6.5 mm. A comparative analysis of the construction characteristics of the previously mentioned automatic rifles and their ammunition was completed by using the Expert choice application and the AHP method. On the basis of the obtained results, the conclusion about the most effective automatic rifle was made, with the aim of introducing into operational use and equipping units of the Serbian Army. Based on the results and research, it came to the conclusion that the 6.5 mm automatic modular rifle M17 is equipped with best design characteristics.

Key words*:* analysis, construction characteristics, automatic rifle, AHP method

1. Introduction

The concept for the development of an automatic rifle began in 1910 with the rifle of the famous gunsmith Fedorov, which had a firing regulator and detachable frame. This rifle enters armaments in Russia in 1916. The next invention important for the development of AR was for Germans who in the 1930s began the development of ammunition with medium gunpowder filling that would be lighter than the standard 7.92 mm bullet and thus the weapon more accurate and easier to use in automatic mode. (Jakovljevic,

1995) The most famous weapons in this caliber were the MP43 and the StG.44. The same rifle inspired the famous Mikhail Kalashnikov to design the most famous and popular AK-47 rifle of today.

Most automatic weapon systems are powered by bullet firing energy, whether based on pipe twitch, bolt twitch, or gunpowder gases lending, but there are also externally driven types, such as Gatling system weapons, which can be mechanical, electrical or hydraulic. This type of automatic weapon is usually of a larger caliber and is used in fighter aircraft and ships.

Automatic weapons are characterized by high-velocity burst firing at up to several thousand bullets per minute and loading with a high-capacity magazine. Today's ARs are mostly in 5.56 mm NATO, 7.62 mm or 5.45 mm caliber with the most common magazine capacity of 30 rounds. The effective range is usually up to 600 m.

Modern rifles in the armaments of the armies of the world are equipped with a firing regulator, which provides in addition to bursts and single firing. For the sake of economy and increase in efficiency, modern automatic rifles have a limiter for firing 2-3 bullets in the burst. All modern automatic rifles have sufficient kinetic energy to destroy unprotected people at distances of more than 1000 m so the overall assessment of the quality of rifles depends on many other factors, such as the design characteristics, caliber, rifle length, AR mass, initial bullet speed, effective range, firing rate, magazine capacity, bullet weight, AR reliability.

Modern automatic rifles are increasingly equipped with optical sights, laser target markers, laser rangefinders and ballistic computers. Automatic rifles become modular-type weapons that are equipped with additional systems and devices depending on the task-mission for which they are used.

The development of automatic rifles in our country begins in the late 1960s, a rifle modeled on the AK-47, automatic rifle M70 in 7.62 mm caliber production of Zastava from Kragujevac. Said rifle is manufactured in several different variants.

2. Factors of comparative analysis

Comparative analysis of automatic rifles was performed on the basis of structural characteristics such as: caliber, weapon mass, weapon dimensions, initial bullet speed, bullet mass, magazine capacity, mean turning and theoretical firing rate. The aforementioned characteristics of AR have a direct impact on the efficiency of weapons.

Weapon mass is an important combat feature of automatic rifles, because the requirements and modern concept of warfare tends to decrease the weapon mass as low as possible. The mass of the weapon directly affects the mobility and the ability to transfer fire. In order to provide as low mass as possible, new types of materials (usually polymers) are used, which provide the same characteristics as metals, but with a much lower mass.

Caliber represents the distance between two opposing fields. Automatic rifles most commonly use reduced ammunition 7.62 x 39 mm, 5.56 x 45 mm (NATO), 5.45 x 39 mm caliber. The caliber determines the weapon's effect on the target. In smaller calibers, the stopping power is smaller, the initial bullet velocity is higher, the smaller jerk and the thin bullet metal jacket, and as a consequence, gunshot wounds occur, while in automatic rifles larger calibers, the stopping power is higher and the initial velocity is lower, so the kinetic energy on target is higher and it results in bullet fragmentation in the human body and severe wounding of the living force. (Tancic and associates 2009) Automatic rifles are primarily intended for small and medium-range combat up to 500 m, and it is therefore desirable that the ammunition used has greater penetration power so that it can penetrate both level 3A and level 4 ballistic protection at distances of 500 meters or more. Caliber is one of the most significant characteristic of automatic rifles. In this paper were analyzed automatic rifles of 7.62 mm, 5.56 mm and 6.5 mm caliber.

Automatic rifle length means the length from the beginning of the muzzle to the shoulder support on the stock. The automatic rifle length has the greatest influence when handling and carrying weapons, and therefore the automatic rifle length is a very important feature. If the automatic rifle is longer it reduces its mobility and is more demanding for handling in a small space, so it tends to make the length of the automatic rifle shorter to increase the mobility and handling indoors, but long enough not to reduce the precision that is immediate dependent on the length of the pipe. Most modern automatic rifles have a folding or telescopic-type stock, which significantly reduces their length.

The initial bullet velocity represents the grain velocity at the moment of leaving the muzzle. Higher initial velocity directly affects the firepower of the weapon, thereby increasing the kinetic energy of the bullet, and thus the effect on the target. Smaller caliber rifles achieve a higher initial bullet velocity than larger caliber rifles, which is directly conditioned by the weight of the bullet.

Magazine capacity is another basic parameter that directly affects the firepower of a weapon. Increasing the magazine capacity increases the mass and dimensions of the weapon, but also increases the practical firing rate. Automatic rifles require high firing rates, and smaller capacity magazines empty relatively quickly and require frequent replacement. The small capacity of the magazine and its frequent replacement directly affect the safety and security of the shooter in performing combat operations. For this reason, automatic rifles need more magazine capacity, to reduce the frequency of magazine replacement in combat. The standard AR magazine capacity is 30 rounds.

The mass of the bullet has a direct effect on the initial velocity of the bullet, and therefore on its penetration as well as the kinetic energy of the projectile. The mass of the bullet is inversely proportional to the initial velocity, the larger the mass of the bullet decreases the initial velocity. Higher bullet velocity directly affects the projectile's penetration.

The type of basic sight used on a particular AR significantly affects the accuracy and precision of shooting, which is one of the most significant features of automatic rifles. Depending on the type of sight, the magnitude of the direct shooting errors also depends.

Firing rate is a design feature that has a direct impact on combat operations, as it represents the number of rounds fired per unit of time and has an effect on the firepower of the weapon.

Probable deflection (Pd) is a measure of the dispersal of hits whose magnitude is chosen such that half of the hits are equally likely to be smaller and the other half of the hits larger than the absolute value. (Kokelj and Randjelovic, 2018) Probable deflection is one of the most significant features that characterize the accuracy and precision of AR shooting (Radovanovic and associates 2016, Randjelovic and associates 2019a).

3. Characteristic of automatic rifles

An automatic rifle is a type of firearm designed for firefighting against unprotected and ballistic vests protected by live force, and a rifle equipped with a trombone or grenade launcher can produce damage to objects and non-combat and lightly armored combat vehicles, it is also possible to illuminate and smoke the battlefield. The M70 AB2 automatic rifle (image 1) has the ability to fire a trombone (Federal Secretariat for National Defense, 1983), while the M21A automatic rifle has the ability to shoot with a grenade launcher (Stamenov, 2009). The M17 automatic modular rifle does not have the ability to fire a trombone and a grenade launcher. The M70 AB2 and M21A automatic rifles have mechanical sights, while the AMR M17 does not have a mechanical sight, it only has a reflex sight.

Figure 1. M70 AB2 automatic rifle

The M70 AB2 automatic rifle does not have the option of mounting accessories (optical, passive, reflex sights, laser target marker), and the M21 and M17 rifles have that capability. The AR M70 basic sight is mechanical, the AR M21 (image 2) basic sight is optical, and for AMR M17 the basic sight is reflex. The use of optical and reflex sights increases the accuracy and precision of shooting compared to a mechanical sight, due to the lower possibility of creating error during aiming, which directly affects the efficiency of the rifle and the probability of hitting the target.

Figure 2. M21A automatic rifle

The automatic modular rifle M17 (image 3) is characterized by the fact that it has an interchangeable barrel and the possibility of using two calibers (6.5x39 and 7.62x39 mm.), which depending on the needs, doubly affects the efficiency of the rifle. Positive fact is the ability to use two different calibers and the rapid ability to replace barrels. The downside is the need to carry two ammunition kits as well as two types of magazines that need to be replaced due to the replacement of the barrel, which puts additional burden on the soldier. This paper analyzes the characteristics of AMR M17 in 6.5 mm caliber.

Figure 3. Automatic modular rifle M17

Table 1 shows the constructional, tactical, technical and combat characteristics of the automatic rifles manufactured at the Zastava Kragujevac factory, namely AR 7.62 mm M70, AR M21 5.56 mm M21 and AMR 6.5 mm M17.

Table 1. Characteristics of automatic rifles

characteristics of automatic rifles	M70 AB2 AR 7,62 mm	M21A AR 5,56 mm	M17 AMR 7,62/6,5 x 39 mm	
Caliber	7,62 x 39 mm	5,56 x 45 mm	7,62 x 39 mm	6,5 x 39 mm
automatic rifle length with folded stock	640 mm	750 mm	685 mm	
automatic rifle length with unfolded stock	950 mm	998 mm	850/935 mm	
firing rate	600 bullet/min	550-650 bullet/min	600 bullet/min	
magazine capacity	30	30	30	20
automatic rifle mass with empty magazine	3,7 kg	4,5 kg	3,5 kg	3,55 kg
mass with empty magazine	0,36 kg	0,35 kg	0,21 kg	0,16 kg
initial bullet velocity	720 m/s	914 m/s	840 m/s	760 m/s
bullet mass	17 g	12,1 g	16,1 g	17 g
bullet mass (grain)	8 g	4 g	7,1 g	8 g
basic sight	mechanical sight	optical sight	reflex sight	
ultimate bullet velocity at a distance 100 m	616	821	765	650
ultimate bullet velocity at a distance 300 m	435	647	628	475

4. Analysis of automatic rifles

Analytical hierarchical process (AHP) is one of the most well-known methods of scenario analysis and decision making by consistently evaluating hierarchies whose elements are goals, criteria, sub-criteria and alternatives. The method was modeled by Thomas L. Saaty (Tomas L. Saaty) in 1980 and is a tool to help decision makers solve complex problems. (Saaty 1980)

The analytical hierarchical process belongs to the class of soft optimization methods. It is basically a specific program for forming and analyzing decision hierarchies. (Nikolic and Borovic, 1996) The analytical hierarchical process method first enables the interactive creation of a problem hierarchy as preparation of decision scenarios and then evaluations in pairs of hierarchy parameters (goals, criteria and alternatives) in a top-down direction. In the end, a synthesis of all evaluations is realized and, by a strictly determined mathematical model, the weight coefficients of all elements of the hierarchy are determined. The sum of the weight coefficients of the elements at each hierarchy level is equal to 1 which gives the decision maker to rank all the elements in the horizontal and vertical directions.

The AHP method allows for an interactive analysis of the sensitivity of the valuation process to the final ranks of the hierarchy. In addition, during the evaluation of the hierarchy factors, until the end of the procedure and the synthesis of the results, the consistency of the reasoning of the decision makers is checked and the correctness of the obtained ranks of the alternatives and criteria, as well as their weight values (Ranđelović and assosiates 2019b).

Using the Expert choice software package and the AHP method, a comparison was made of the design characteristics of automatic rifles from domestic production, with the aim of finding the best alternative for equipping the units of the Serbian Armed Forces.

The criteria (initial bullet velocity, effective range, AR mass, type of sight, caliber, mean probable 100 m deflection, bullet weight, rifle length, firing rate, magazine capacity) from which the effectiveness of automatic rifles were evaluated were derived from analysis of literature in the field of shooting theory and ballistics, results of conducted research and expertise and experience of members of the Ministry of Defense.

By directly entering the weighting coefficients of the criteria given by the decision maker, shown in image 4, with simultaneous graphical and numerical representation of the software obtained priorities (for the stated criteria), global criteria criteria were obtained (image 5).

Figure 4: Criteria weight coefficients

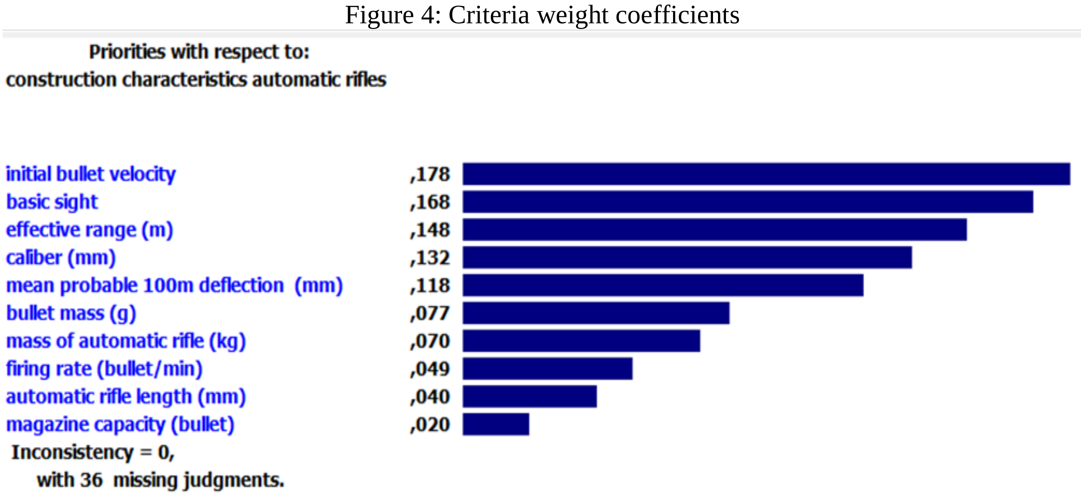
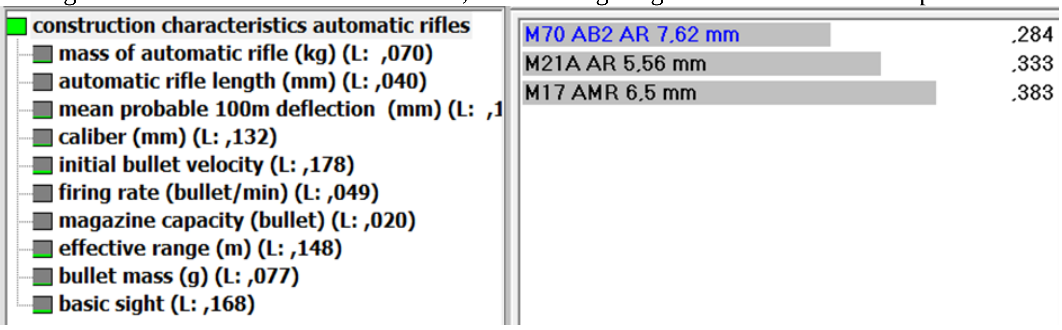


Figure 5: Problem Model - Criteria tree, criteria weighting values and alternatives priorities



Based on the obtained results, a dynamic sensitivity analysis was performed at the criterion level of the structural characteristics of automatic rifles as a function of the target (images 6 and 7). Figure 8 shows a diagram of the sensitivity of the design characteristics of automatic rifles, showing the choice of the most favorable alternative with respect to the given criteria, with a dynamic view for all the criteria individually and with the final solution of the problem.

Figure 6: Dynamic analysis of sensitivity of solution obtained by problem-level synthesis by criteria

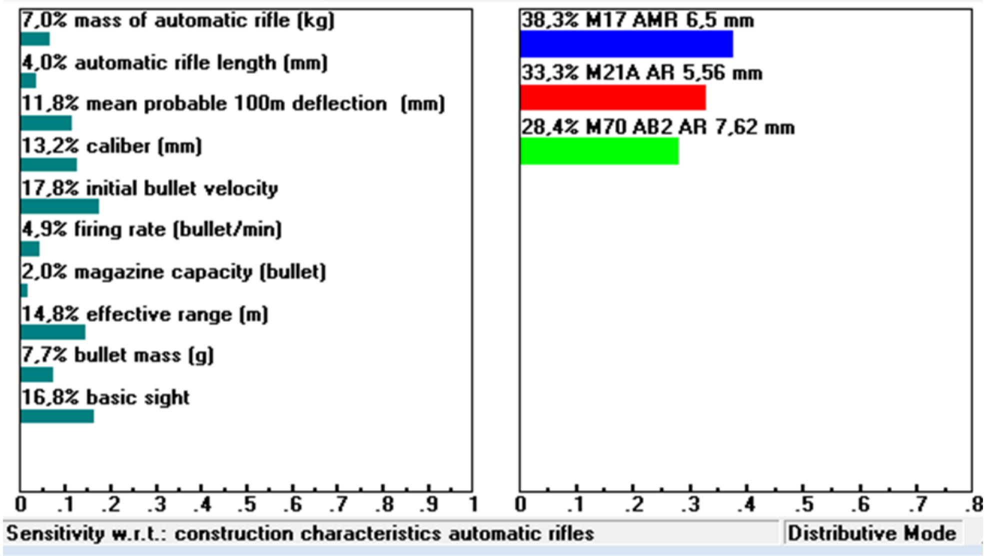


Figure 7: Dynamic sensitivity analysis of the solution obtained by synthesis at the problem level depending on the criteria

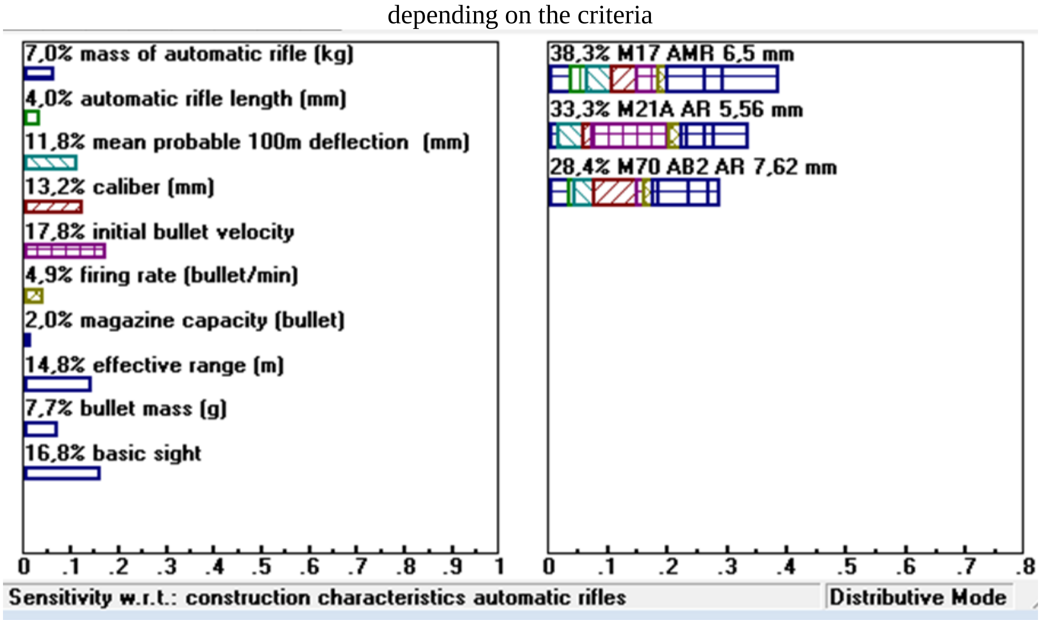
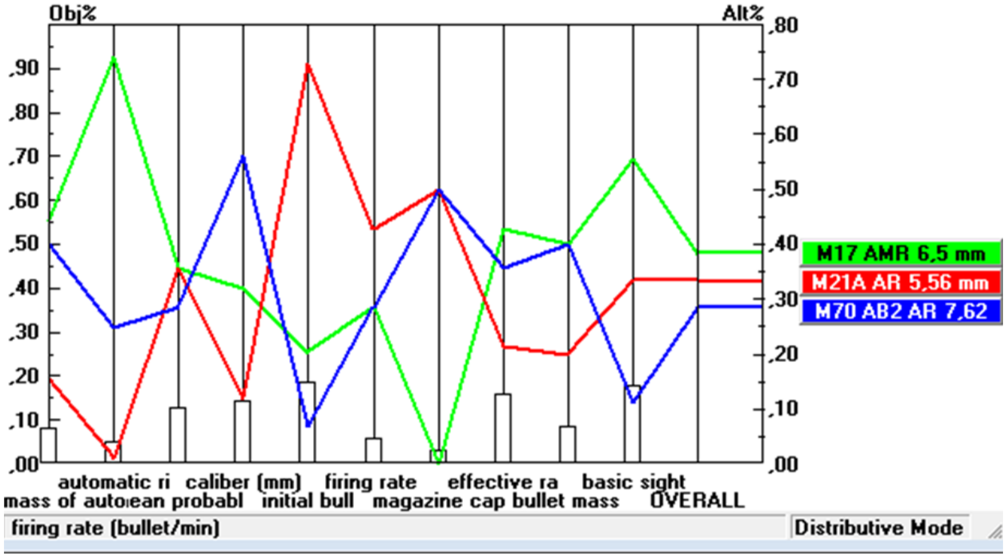


Figure 8: Sensitivity diagram of the construction characteristics of automatic rifles



In addition to the analyzes presented, a head-to-head procedure was also implemented (images 9, 10 and 11) with the aim of comparing the effectiveness of automatic rifles with each other, in order to fully understand the ratio of the results.

Figure 9: Analysis of the construction characteristics of automatic rifles AR M70 and AMR M17

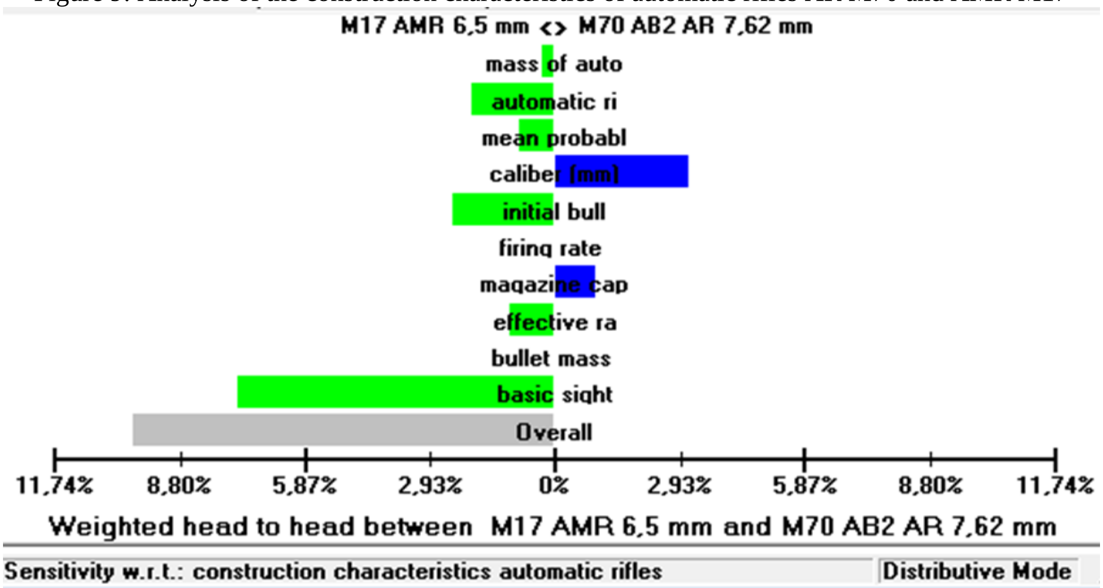


Figure 10: Analysis of the construction characteristics of automatic rifles AR M70 and AR M21

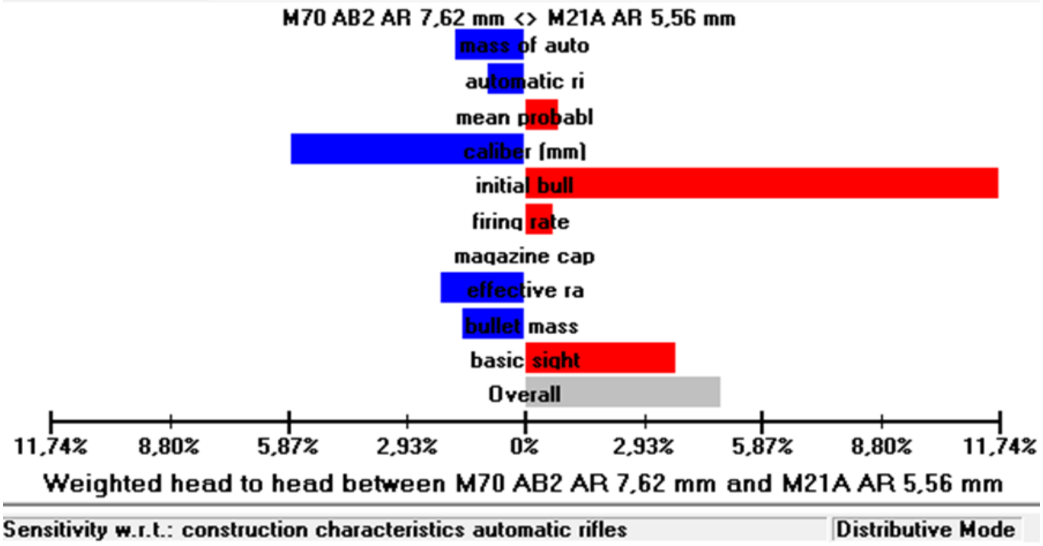
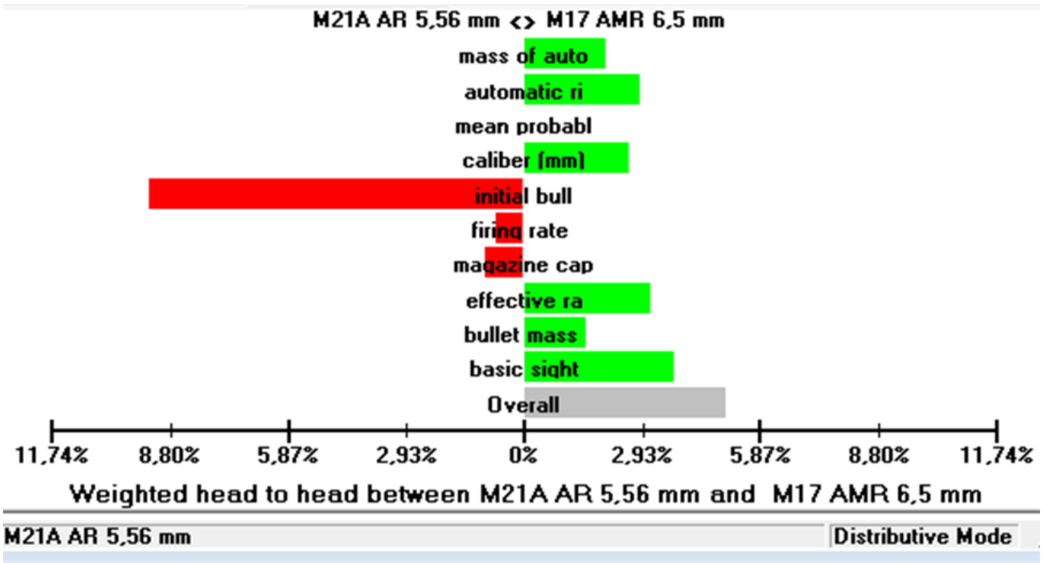


Figure 11: Analysis of the construction characteristics of automatic rifles AMR M17 and AR M21



Priorities of alternatives by each criteria were obtained based on the absolute values of the criteria by alternatives (Table 1). The result of synthesis of problems of structural characteristics of AP based on the research results are presented in the form of multi-criteria ranking list of alternatives (image 12).

Figure 12: Multi-criteria rank list of automatic rifle design features at target function level

Analyzes of the research results, as well as the conclusions, show the following:

- the efficiency of automatic rifles, depending on their structural characteristics, is influenced by: initial bullet velocity with 17.8%, effective range 14.8%, mass of automatic rifle with

7%, type of basic sight with 16.8%, caliber with 13.2%, mean probable 100 m deflection with 11.8 %, AR length 4%, theoretical firing rate 4.9% and magazine capacity 2%;
- the M17 automatic modular rifle stands out with 38.8%, followed by the AR M21 with 31.9%, while the worst results were recorded by the AR M70 with a total of 29.3%;
- the AMR M17 has a 6.9% better construction performance than the AR M21, and 9.5% better construction performance than the AR M70, while the AR M21 has 2.6% more significant performance than the AR M70;
- automatic modular fifle M17 6.5 mm rifle achieved the best results on analysis during the research.

5. Conclusion

For successful realization of the analysis, the Expert choice 2000 program was used in the work, the AHP method is also used, as one of the multi-criteria optimization methods, in solving the problem of selecting the model of automatic rifle with the best constructional characteristics, in order to equip the units of the Serbian Armed Forces.

In addition to defining problems, criteria and alternatives, the process of applying the method is described. By expert selection and evaluation of selected criteria and comparison of created models (alternatives) the model that represents the optimal solution for the given criteria has been chosen.

It can be concluded that in the particular problem, two criteria are particularly preferred, namely initial bullet velocity and effective range. The software solution has proven to be very practical and effective in finding the optimal solution, that is, analyzing different variants of the problem solving approach. In the context of decision support, using the Expert choice 2000 software package, it was concluded that the AMR M17 6.5 mm automatic rifle model possesses the best construction characteristics, which is 6.9% better than the AR M21A. The diagrams show the percentages of the representation of individual construction characteristics in each of the alternatives. The tool only suggests a possible solution, but the final decision is still made by the decision maker and he remains the elemental factor in the choice of the most effective model of automatic rifle.

Based on the conducted research, it is concluded that the M17 automatic modular rifle possesses the best construction characteristics and is the optimal choice for solving the problem of choosing the most efficient automatic rifle in domestic production.

For the purpose of the research, basic sights were used for each automatic rifle, for AR M70 it is a mechanical sight, for AR M21 it is an optical sight, while AMR M17 uses a reflex sight as a basic one. Continued research should be directed towards a comparative analysis of the results of shooting automatic rifles at different distances and in different conditions, in order to obtain a completely clear picture of the most effective automatic rifle, with the aim of equipping the units of the Serbian Armed Forces.

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Implementacija blokčejn tehnologija u pametnom gradu

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Apstrakt: Ovaj rad predstavlja pokušaj da se ustanove smernice za implementaciju projekata informacionih sistema koji su zasnovani na blokčejn tehnologiji u pametnom gradu u cilju iskorićavanje prednosti ove tehnologije za povećanje stepena sigurnosti i održivosti. Iako su dostupni naučni izvori retki, ovaj rad pokušava da slabe tačke infrmacionih sistema u pametnim gradovima uporedi sa prednostima blokčejn tehnologije kako bi se ponudio potencijalno rešenje za slabosti i unapredio informacione sisteme u pametnim gradovima, a samim tim i nivo održivosti. Ovo istraživanje samo pokazuje potrebu za implementacijom ovih tehnologija kao potencijalnom rešenju i razmatra dalje istraživanje koje je neophodno kako bi se ustanovio radni okvir za implementaciju blokčejn tehnologija u pametnim gradovima.

Ključne reči: Blokčejn, Pametan grad, Upravljanje projektima, Informacioni sistemi, Održivi razvoj

Implementation of blockchain technology in the smart city

Abstract: This document presents an attempt to determine guidelines for the implementation of the blockchain projects within smart city (SC) information systems (IS) to improve their security and sustainability through harnessing benefits of blockchain technology. Aldo available scientific sources are scarce a review of contemporary scientific literature and other available sources attempts to determine weaknesses of current IS within SC and to compare their vs. benefits of the blockchain technology in order to show that blockchain technology can offer potential solution to weaknesses and improve SC IS and therefore the sustainability of the SC itself. However, this research only shows the need for such implementations and discusses what further research is required to provide a framework for the implementation of blockchain technology in smart cities.

Keywords: Blockchain, smart city, project management, information systems, sustainability

1. Introduction

This paper elaborates downsides of IS within SC found within the scientific literature and the promise delivered by the blockchain technology to solve them. In the brief review of most common problems and limitations of ICT within SC and a brief review of strongpoints of blockchain technology, a synthesis is attempted. This synthesis shows that there is a possibility that blockchain technologies can improve IS security, privacy and network availability — furthermore the scientific. Accepting blockchain technologies and exploring ways to apply these technologies to addressing challenges in smart cities is a research direction and represents a new area that has not been sufficiently explored through the prism of scientific research because blockchain technologies were recently adopted with creation of Ethereum Enterprise Alliance in 2017. (htt) The result of the research in this paper is to show the possibility for improvement of IS within SC with the application of blockchain technology and to search for a scientific founded framework for the implementation of blockchain technologies.

There are strong indications that the application of blockchain technologies improves existing systems based on automatic data processing while ensuring increased security, transparency and easier participation of a large number of actors, regardless of whether they are natural or legal persons (see literature review in chapter 2.). Although the term Information Systems in Smart Cities marks a very broad term, this research refers to software solutions in smart cities that are related to e-government and fields of application of blockchain technology: payments, infrastructure for payment and exchange, smart contracts, identification, confidential data, data storage, voting and fundraising.

In scientific literature, blocking technology has not been sufficiently explored since its beginning is related to 2008 (Nakamoto, 2008), while wider acceptance by large corporations only in 2017 (htt), therefore there are not enough scientific studies of the application of this technology in practice. This technology is still in its early adoption phase, and the lack of use cases and standards make scientific research documents very scarce.

2. Blockchain technology in the smart city

A brief literature review is examining the problems encountered by IS in smart cities and examples of the application of blockchain technology to contribute to the sustainability of a smart city as well as any limiting circumstances related to the application.

One of the known definitions of the smart city (ITU) is: "A smart and sustainable city is an innovative city that has extensive use of information technology using them to develop the quality of life level, city administration, by taking into the account the needs of current and future generations in the same way as it takes into account economic, social and environmental aspects. (htt1)

Dameri and Rosenthal, (2014) in the collection titled "Smart City - How to create a public and economic value in an urban area with high technology" give the idea that citizens expect to live in urban dwellings that are designed to provide a high quality of life which can only be achieved through investments in sustainable development. The complexity of the concept of a smart city is nonsense from the fact that the concept itself is connected simultaneously with the physical flow and the intellectual and social capital of the city. In this regard, planning the city is not just a design of urban environments to incorporate social, political and economic studies. The concept of smart cities by them is essentially supported by the development of ICT technologies. (Dameri, R.P., Rosenthal-Sabroux, C., 2014)

ICT solutions are considered as a key factor in building smart cities because of their ability to support a large number of services for citizens. Because of this, it must be pointed out that in the smart cities a large number of versatile devices are coexisting, they are equipped with heterogeneous technologies, but they will nevertheless be joined in interaction using a large number of services. (Piro, G., Cianci, I., Grieco, L.A., Boggia, G., Camarda, P., 2013)

The group of authors believes that the information systems of the city are crucial for the relation of intelligence (intelligence) and innovation. They believe that ICT is a key component for the development of knowledge-based organisations and intelligent cities. As ICT develops, the number of users and cases of use increase. (Komninos, The architecture of intelligent cities: Integrating human, collective and artificial intelligence to enhance knowledge and innovation, 2006)

Due to the above, the following challenges will arise: service availability, location dependency problem, security problem and user identification, mobility problem - it is necessary to enable users to move between networks, the problem of scaling large numbers of users without reducing the quality of service, the problem of error tolerance. Due to these challenges, it is necessary to create information systems that can be more resistant to systemic errors and system failures. (Piro, G., Grieco, L.A., Boggia, G., Chatzimisios, P., 2020)

The literature prevails that existing Internet architectures cannot respond to the before mentioned challenges. (Ahlgren, B., Dannewitz, C., Imbrenda, C., Kutscher, D., Ohlman, B., 2012), (Jacobson, V., Smetters, D.K., Thornton, J.D., Plass, M.F., Briggs, N.H., Braynard, R.L., 2009), (Melazzi, N.B., Chiariglione, L., 2013)

The group of authors in its work as the biggest challenges also signifies privacy, analysis and data search, data integration, GIS-based visualisation, service quality and intelligent systems that use these data. (Hashem, I., Chang, V., Anuar, N.,Adewole, S., Yaqoob, I., Gani, A., Ahmed, E., Chiroma, H., 2016)

The privacy problem is created by the large amounts of personal information about the smart city's residents who are the subject of the analysis and can, therefore, be misused for making personal profiles. For example, a large amount of data on the social activities of individuals is collected every day. Although a lot of effort has been invested in solving this challenge, saving large amounts of personal data is a problem. Although the number of successful hacker attacks is very low, a constant battle for data retention is on-going and a growing number of cyber security problems that smart cities have to deal with. (Tene, O., Polonetsky, J., 2012)

In addition to the problem of privacy, one of the problems that are certainly interesting for the topic of this research is the problem of quality and availability of the service. A group of authors thinks that to establish a smart city a large number of technologies must be integrated and hence the quality of service provided by different technologies represents a major challenge for the success of a smart city. (Bellavista, P., Corradi, A., Reale, A. , 2015)

Progress in ICT solutions has been facilitated not only by the development of the private sector but also by public administration institutions and how they perform operational activities. (Stragier, J., Verdegem, P., Verleye, G., 2010) Progress in ICT has allowed local governments to transform the way they offer services to citizens. (Komninos, Intelligent Cities: Innovation, Knowledge Systems and Digital Spaces, 2002), (Gupta, B., Dasgupta, S., Gupta, A. , 2008)

Blockchain technology, which became known primarily thanks to bitcoin (Bitcoin), is a type of distributed system technology further referred to as Distributed Ledger Technology (DLT), which is defined as a "distributed, shared, encrypted database that serves as irreversible and non-recoverable (non-corrupt) information repository". (Wright, A., De Filippi, 2015) When blockchain technology is used to create a platform, the product is a digital platform that stores and verifies the entire transaction history between its users anywhere on the network. From a technical point of view, blockchain is a "database consisting of chronologically arranged series of transactions known as blocks" about which each proposed transaction must be checked with the certainty and integrity of that particular block". (Wessel quoting BoE Blockchain Technology)

Once the information is entered, it can never be deleted. (Embracing Disruption –Tapping the Potential of Distributed Ledgers to Improve the Post-Trade Landscape, Deposit Trust & Clearing Corporation, 2016) Block technology is described in the literature as a database and as a network equipped with a built-in security system and internal integrity. (Pilkington, 2014)

One of the applications of blockchain technology is the development of smart administration as part of the 3.0 phase of the blockchain technology development through the idea of providing services traditionally provided by public administrations in a more efficient, decentralised and cheaper way. (Shojafar, M., Cordeschi, N., Baccarelli, E., 2016)

3. Conclusion and further research

The review of the contemporary scientific literature shows that the main problems of IS within SC such as privacy, security, availability and heterogeneous architectures correspond with strong points of blockchain technology because blockchain based systems provide strong security together with total anonymity, their distributed nature also increase availability and finally their nature is interoperable.

Although the blockchain technology is relatively new, fundamental studies of the technology itself exist in each problem domain including security and literature on distributed systems (for example, multi-level authorisation (Cordeschi, N., Amendola, D., Shojafar, M., Baccarelli, E., 2015), energy efficient resource management in distributed systems. (Yli-Huumo, J., Ko, D., Choi, S., Park, S., Smolander, K., 2016), (Efanov, D., Roschin, P., 2018) A careful look and acceptance of proven solutions would speed up the overcoming of the current challenges and limitations of blockchain technology. (Burgess, K., Colangelo, J. , 2015)

In scientific literature, papers are dealing with the use of blockchain technology to increase the sustainability of smart cities, as shown in the literature review. The available scientific literature has not so far dealt with the challenges, limitations and effects of the implementation of blocked IS in smart cities. The available materials on this subject are not scientific. Secondary sources on this subject can be found in studies conducted by major consulting companies such as Deloitte (htt2) or in the forms of whitepaper presented upon blockchain project pitch events.

However, the authors did not find any working framework for the implementation of information systems projects (IS) based on these technologies in the scientific literature. According to the authors, it is necessary to mark the areas of application of this technology in smart cities and to continue to explore ways of applying to define the success factors and results indicators for the implementation of the IS projects based on block technology.

To achieve a higher degree of sustainability in smart cities, it is necessary to define subsystems whose business would be improved by the use of block technology. Analysing the problems and the previous effects of the application of blockchain technology will identify the smart cities sub-systems that realise the greatest benefit from the implementation of this type of projects with the high performance of the projects themselves. The data obtained using this scientific method would be further used to establish critical success factors and indicators of the results of project implementation of this type. Based on the identification of the field of successful application of information systems in smart cities and critical success factors as well as the result indicators, a working framework for the implementation of information systems projects based on technologies in smart cities can be created.

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Lanac profitno orijentisanih usluga

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Apstrakt: Glavni fokus ovog rada je na pokazivanju značaja poslovnog modela usluga. Poslovni model se koncentriše na stvaranje i prisvajanje vrednosti iz poslovanja. On opisuje strategiju organizacije da stvara ekonomsku vrednost, predstavlja osnovni šablon kako bi organizacija mogla da se takmiči u tržišnoj konkurenciji, kao i sam način na koji će kompanija da ostvari projektovani profit, kao i način na koji će organizacija da postupa sa internim i eksternim stejkholderima. Poslovni modeli predstavljaju veoma bitnu funkciju u svakoj organizaciji. Kako bi organizacija bila što uspešnija, oni moraju da budu što inovativniji da bi odgovorila datom okruženju organizacije. U završnom delu rada date su smernice odnosno, predlozi kako da se proširi poslovni model.

Ključne reči: poslovni model, inovacija, organizacija, usluga

Service profit chain

Abstract: The main focus of this paper is to highlight the importance of the business model in service. The business model concentrates on creating and appropriating value from the business. It describes the basic strategy of an organisation to create economic value. It is a basic template for how an organization can compete in a market, as well as the way a company will generate projected profits, and how an organization handles internal and external stakeholders. Business models are a very important function in every organisation. In order for an organization to be as successful as possible, they need to be innovative so that they can respond to the organisation's given environment. The final part of the paper gives guidelines respectively.

Keywords: business model, innovation, organisation, services

Introduction

The business model as a term was first mentioned in a 1957 article (Bellman et al. 1957) then in the title and abstract of a 1960 article (Jones, 1960). According to Chesbrough and Rosenbloom (2002), the concept of the business model is rooted in Chiller's 1962 strategy book and structure who then popularized the concept of business strategy. However, it was not until the late 1990s that the concept of the business model began to be used more frequently and was associated with e-commerce and the emergence of the so-called new economies (Wirtz et al., 2015).

Zott, Amit, and Massa (2010) provide an overview of business model types in e-commerce, while Fielt (2014) describes the development of the business model concept in more detail. Business models have evolved most within the land of business economics, to be precise, management, with Chroneer, Johansson, and Malmstrom (2015) citing three stages of business model area development. The first, development phase, involves defining business models (eg Amit and Zott, 2001), the second stage details the elements of business models (eg Petrovic, Kittl, and Teksten, 2001), while the third stage presents the business model as a comprehensive and integrated framework (e.g., Osterwalder and Pigneur, 2010). The chain of profit-oriented services was developed by a group of researchers.

A chain of profit-oriented services

The Service Profit Chain (in the following text as SPC) is a theory and business concept developed by a group of researchers at Harvard University in the 1990s. The concept was first introduced as a 1994 Harvard Business Rewiev article by James L. Heskett, Thomas Jones, Gary Loveman, V. Earl Sasser and

Leonard Schlesinger and 3 years later was the subject of a book, The Service Profit Chain (SPC) - About how leading companies link profit and growth to loyalty, satisfaction and value, the book was published in 1997. In the book, the authors discuss why there is this strong and direct link between employee satisfaction and customer loyalty and profitability. The basic idea behind the profit chain is that there is a direct link between profit, growth, customer loyalty, customer satisfaction, delivery value, employee capability, satisfaction, loyalty and productivity chain.

Profit and growth are stimulated primarily by customer loyalty. Loyalty is a direct result of high customer satisfaction. Satisfaction depends largely on the value of the services provided to the clients. Value is created by satisfied, loyal and productive employees. In the end, employee satisfaction is the result of high quality support services and policies that empower employees to serve their customers well - this is also an essential quality. If we want to influence the higher level (growth and profit), then we must first base ourselves on the lower level, internal quality.

Profit and Growth: The vast majority of successful service companies have a purpose other than profit to profit and growth that are only tangible outcomes of execution toward that higher end. Customer Loyalty: It has been found that a high degree of customer loyalty is the number one factor driving profit and growth in the service business. Customer Satisfaction: Obviously there is no loyalty unless there is high satisfaction first. Satisfaction is closely linked to expectations. When we get what we expect, we are basically happy.

Value: For a service experience that provides basic satisfaction, it must have customer satisfaction. There are many examples in the world of companies that are lost along the way and have forgotten that it is not about what the company believes in delivering, but what the consumer expects to receive.

Employee Productivity: The ability to understand and translate what customers are really looking for and turn that desire into delivering the right products and services.

Employee loyalty: Retaining great people in their positions over time directly affects our ability to deliver value.

Employee Satisfaction: The obvious first step to great loyalty is basic employee satisfaction. Basic satisfaction is closely linked to the context of work - the environment in which jobs are performed.

Internal Quality: In order to reach a basic level of satisfaction and, hopefully, over time, more than that, we need to work on the context of the job and the content of the job. Getting context and content is fuelled by the team cycle.

The elements of SPC

Customer loyalty and satisfaction in practical terms, it can be said that enthusiasm and loyalty signify a very high level of satisfaction. But we need to differentiate between them because they are driven by different factors. If we thought that the relationship between loyalty and satisfaction is linear, therefore more satisfaction results in an equal increase in loyalty. Unfortunately, this is not the case at all. We can best illustrate this by looking at a graph of the relationship between loyalty and satisfaction. One of the most prominent theories that explain the connection between company employees, customers, and how they relate to the overall performance of the company is SPC.

This framework, proposed by Heskett et al. (1994), is an integrative framework that indicates that employees are satisfied, able to deliver high quality services that will meet or exceed customer expectations, creating customer satisfaction; satisfied customers, in turn, would become loyal to the firm, leading to improvement business through outcomes such as buyout and negotiation. This framework, which is particularly suitable for firms in the service sector because of the interaction between the front line of workers and consumers, is a cross-section of research in the fields of human resources, organizational behaviour and marketing.

The unique nature of services, including simultaneous production and consumption, the untouchability of service processes and outcomes, and the involvement of consumers in manufacturing service (Bowen & Schneider, 1988), emphasize the importance of interaction between the front line of employees and customers. Therefore, front-line performance of employees, or their behaviours, help and serve customers to address their needs (Liao & Chuang, 2004), directly influences the perception of service quality and customer satisfaction. This framework is used because of the saturation of the service sector worldwide. For example, services account for 60% of world gross domestic product (GDP) and are dominated by economies in most countries (e.g., 70% of GDP in Canada, 78% in the UK, 72% in Japan, and 80% in the United States) (The World Factbook, 2011).

An important assumption is proposed by Heskett et al. (1994), who argue that there is a causal consequential arrangement between connections within the SPC. However, there is very little empirical evidence to support this claim. In order to support the framework as a whole, this would require data collected sequentially from multiple sources (i.e. employees, clients and businesses) that would allow testing for lag effects. However, there are a few exceptions that have tried to support all connections.

Loveman (1998) provided an empirical examination of the entire chain from a banking context and found support for all links. Similarly, Harter, Schmidt, and Hayes (2002) conducted a comprehensive study in approximately 8,000 business units, which established a link between employee satisfaction and different customer outcomes, such as customer satisfaction - loyalty and hard work (profit). However, this was a meta-analytic study, conducted on the basis of survey data collected throughout, making it impossible to relate units and customer experiences. Finally, Lee, Leung, and Cheng (2011) collected data from over 200 high-contact service centres and found that most of the proposed relationships in the for-profit service chain are highly significant, supporting Heskett et al. (1994) original proposal. However, in this study, store employees provided information about levels of customer satisfaction and loyalty versus customers themselves, which limits the accuracy of conclusions. Therefore, there is a need for a study that tests links in the chain by simultaneously collecting data from employees, users and businesses.

Customer results at SPC

Service quality, customer satisfaction, service loyalty, and solid performance: According to Heskett et al. (1994), the SPC proposes that, if a high quality service is provided to users, many beneficial outcomes result. For example, after numerous positive encounters with services, a sense of satisfaction will be felt by the customer, leading to useful outcomes such as buying the service and advocating through referrals and positive words, which directly affects the firm's performance. Delivering high quality service is important for every business, but especially for service based services. Service quality or the perceptions that come from comparing customers to their expectations before meeting their perceptions of their actual experience (Grönroos, 1990) is one of the most important and purely researched topics in service marketing (Zeithaml, 2000).

Perceptions of high quality service have been found to be essential for both consumer and business outcomes. Continuously exceeding customer expectations enables the company to improve customer loyalty, giving the company a competitive edge (Zeithaml, Bitner, & Gremler, 2006). Parasuraman et al. (1988) found that clients base themselves on their perceptions of service quality in five different dimensions. The dimensions that are considered important for clients in assessing service quality are reliability, sustainability, safety, empathy and tangibility. Reliability refers to the trust and ability of the company to perform the service appropriately, responsiveness refers to the willingness of the service provider to assist customers and provide prompt service. Insurance is about the knowledge and kindness of employees and their ability to inspire confidence in their customers. Empathy refers to the caring, individualized attention that a service provider provides to its customers.

Lastly, tangible things refer to things physically observed by clients. Unlike the tangible elements of service quality, which may be similar among close competitors, the intangible aspects, which are entirely dependent on encountering the service, can open a significant gap between firms that have the potential to become a source of sustainable competitive advantage (Kuei, 1999).

Therefore, if comparing customers with their expectations before meeting the service satisfies or exceeds their perceptions of the actual experience (Grönroos, 1990), it is likely to result in customer satisfaction. Customer satisfaction, "consumer response to fulfilment, the degree to which the level of fulfilment is pleasant or unpleasant" (Oliver, 1997, p. 28) was an important aspect for business users. Although empirical research has supported the relationship between service quality and satisfaction (e.g. Silvestro & Cross, 2000), there is debate as to whether service quality and customer satisfaction represent the same construction in addition to causality between the two constructs. However, since service quality is a cognitive state and customer satisfaction is an affective state (Carrillat et al., 2009), it has not only been shown to represent different constructs (Carrillat et al., 2009; Parasuraman et al., 1988), based the view that cognition precedes emotions in the causal chain of psychological processes provides a sound rationale that quality of service truly predicts customer satisfaction (Oliver, 1997).

Multiple studies have supported various parts of the SPC user side. For example, a number of studies have identified rated service quality as one of the key drivers of customer satisfaction and loyalty-based outcomes (e.g., Bloemer, de Ruyter, & Wetzels, 1999; Boulding, Kalra, Staelin, & Zeithaml, 1993; Carrillat et al. ., 2009; Cronin et al., 2000; Taylor, Nicholson, Milan, & Martinez, 1997; Zeithaml, Berry, & Parasuraman, 1996). Therefore, it is vital that businesses are successful in producing high quality services.

One of the key elements considered in a successful service-based business is front-line employees (Davidson, 2003; Tsaur & Lin, 2004). Front-line employees, also known as frontier keys or contact employees, deal directly with customers during a service encounter. In the human resource management literature, numerous scholars have argued that a company's human capital (i.e., highly skilled and highly motivated workforce) has the potential to be a source of competitive advantage (e.g., PM Wright, McMahan, & McWilliams, 1994).

Prior research supports the idea that front line employees make a significant contribution to service quality, and thus to customers, attitudes, and intentions (e.g., Bitner, Booms, & Tetreault, 1990; Salanova et al., 2005). Front-line employees are important because they act as a "link" between the organization and its customers (Schneider, White, & Paul, 1998); however, they act more than simple informants. In this way, employees are aware of the values on the front line of the organization, they play an active role in understanding, filtering and interpreting information and resources in and from the organization (Zeithaml, Bitner, Gremler, Mahaffey, & Hiltz, 2007). They perceive and respond to whether the company’s communication of value and delivery of quality service truly meets the needs of clients, which ultimately affects the perception of service quality. These employees are constantly faced with unique situations, which poses a significant challenge because it reflects that each situation is different because no two clients are exactly alike.

Each client presents a different set of needs, and the employee is required to properly understand these needs and adjust their behaviour to respond accordingly (Solomon, Surprenant, Czepiel, & Gutman, 1985). For service organizations, this issue is further amplified when a company has several business units. Customer service can vary significantly across units within the same organization, and this variability helps to explain differences in customer loyalty across the organization (Fleming, Coffman, & Harter, 2005).

Front-line employees are also important because they act as representatives of the organization. Front-line employees play an active role in service encounters because they act as the face of the organization and for this reason, front-line employee performance is critical to customer perceptions of service quality and ultimately customer outcomes such as satisfaction and loyalty (Dimitriades, 2007; Gracia, Figures, & Grau, 2010). This is important because happy, long-term customers "buy more, take less company time, are less price-sensitive, and bring in new customers" (Reichheld, 1996). It is important to find that modest increases in service quality and customer satisfaction based on interactions with front line employees are likely to lead to a significant increase in financial performance (Gruca & Rego, 2005), due to customer retention, loyalty and capital (Reichheld, 1996; Zeithaml, 2000).

This further motivates firms to decipher ways to motivate employees to consistently perform above customer expectations. Satisfied, motivated and dedicated front-line employees are a powerful engine for delivering quality of service and customer satisfaction, and such workforce is considered a valuable tool for developing a loyal customer base (Pfeffer, 1998). After that, it is important to understand the role of frontline employees in enhancing a firm's competitive advantage that contributes both to improving service performance and ultimately to the success of the firm.

Employees and SPC

Worker satisfaction: Heskett et al. (1994) suggested that employees who are satisfied with their job are more likely to provide better services than those who are not. It is believed that employee satisfaction, defined as "a pleasant or positive emotional state arising from the evaluation of work or work experience" (Locke, 1976, p. 1300), is achieved through various HRM practices (P.E. Spector, 1997). For service employees, these practices are designed to enhance employee competencies, motivation and performance in providing quality service to external customers.

Such practices include extensive training services, information sharing, self-management and participation teams, quality-dependent compensation, job design for quality work, performance-based performance assessment, internal service, discretionary services, selective employment and job security (Liao, Toya , Lepak and Hong, 2009).Logic suggests that if organizations design work systems that ensure employees have the knowledge, skills, and abilities to meet client needs, they will be happier with their business, less likely to leave (e.g., Gordon & DeNisi, 1995) and more likely to provide good customer service experience during subsequent meetings (Loveman, 1998).

The research supported this claim in whole or in part. Participants' perceptions of decision-making, reward equity, and growth opportunities were found to be positively related to their development of perceived organizational support, which in turn was positively related to job satisfaction and organizational commitment, also as lower turnover (Allen et al., 2003). Subsequently, because the organization treats its employees well, service employees are likely to treat customers better (Schneider & Bowen, 1985).

Extension of SPC

Despite the suggested links in the service chain, some authors have suggested that job satisfaction is a relatively poor predictor of job performance (e.g. Bond & Bunce, 2003; Iaffaldano & Muchinsky, 1985), which leaves researchers looking for an additional or better predictor of employee behaviour. From a practical standpoint, this is especially important for service organizations, as solid performance is significantly associated with front-line employee performance. However, while satisfaction was not in his predictive ability, we cannot negate the importance of employees who are satisfied with their job. Therefore, it may be that the relationship between employees' attitudes and their later work at their job may be more complicated than previously thought.

In recent years, employee engagement has emerged as a new construct, identified as related but distinct from employee satisfaction at the job level (Ferniez, 2007), and some consider it a better prediction of the firm's overall performance (Harter et al., 2002). Similar to job satisfaction, engagement is a positive emotional and attitudinal response to personal job-related experiences. However, job satisfaction does not cover the full range of affective responses to one's work (Van Katwyk, Spector, Fox, & Kelloway, 2000). Satisfaction is the assessment of an employee at his or her salary rate, benefit level, degree of flexibility in one's job, while being treated fairly. Engagement, on the other hand, represents employee enthusiasm, passion and commitment to their work and organization, willingness to invest and spend discretionary effort to help the employer succeed, (Erickson, 2005; Macey & Schneider, 2008).

According to Kelloway, Barling, Inness, Francis, and Turner (2010), a passion for a business consists of a high level of engagement and excitement from the business itself. If an individual is passionate about their work, they are expected to work on a daily basis and get involved in their work, volunteer for a longer period of time and be happier and more fulfilled when engaging in their work. Employees with positive attitudes toward their workplace are likely to convey those attitudes toward customers and participate in the discretionary effort required to serve high-level clients. For frontline employees, workers are likely to be extended during the interaction they have with clients, as engaged workers tend to be more productive and contribute more positively to the financial success of the firm.

Conclusion

The Service Profit Chain is a theory and business concept developed by a group of researchers at Harvard University in the 1990s. The concept was first introduced as a 1994 Harvard Business Review article by

James L. Heskett, Thomas Jones, Gary Loveman, The Service Profit Chain (SPC) is about how leading companies link profit and growth to loyalty, satisfaction and value.

Profit and growth are stimulated primarily by customer loyalty. Loyalty is a direct result of high customer satisfaction. Satisfaction depends largely on the value of the services provided to the clients. The unique nature of services, including simultaneous production and consumption, the intangibility of service processes and outcomes, and the involvement of consumers in manufacturing service, emphasize the importance of interaction between the front line of employees and customers.

Therefore, front-line performance of employees, or their behaviours, help and serve customers to address their needs, directly influences the perception of service quality and customer satisfaction. Despite the suggested links in the service chain, some authors have suggested that job satisfaction is a relatively poor predictor of job performance, which leaves researchers looking for an additional or better predictor of employee behaviour. From a practical standpoint, this is especially important for service organizations, as solid performance is significantly associated with front-line employee performance.

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Transportna infrastruktura - stub prosperiteta

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Apstrakt: Iako saobraćajna infrastruktura nije među devet stubova koje razmatra Legatum indeks prosperiteta, ona utiče na određene stavke, tako što doprinosi ekonomskom razvoju olakšavanjem i jačanjem ekonomske aktivnosti. U ovom radu polazi se od hipoteze da se uloga transportnog sektora u procesu stvaranja prosperiteta može proučavati iz nekoliko perspektiva. Prvi je tretiranje procesa ekonomskog rasta kao vektora povećanja potražnje za transportom (količina, vrsta, lokacija i način rada). Druga analitička perspektiva odnosi se na ulaganja u transportni sektor u vezi sa mehanizmima za utvrđivanje transportnih tarifa, koji mogu uticati na pojavu tehnološki intenzivnih klastera. U ovom članku predlaže se kako da saobraćajna infrastruktura doprinosi ekonomskom razvoju i poboljšava kvalitet života. Dok pomažemo u unapređivanju procesa „tercijarizacije" evropske ekonomije, aplikativni deo studije imaće za cilj da ukaže povezanost između saobraćajne infrastrukture i broja turista privlačenih u zemlje članice EU.

Ključne reči: prosperitet, saobraćajna infrastruktura, kvalitet života, transportne tarife

Transport infrastructure – a pillar of prosperity

Abstract. Although transport infrastructure is not among the nine pillars considered by the Legatum Prosperity Index, it influences part of them, so it contributes to economic development by facilitating and boosting economic activity. In this paper, I start from the hypothesis that the role of the transport sector in the process of generating prosperity can be studied from several perspectives. The first one is the treatment of the economic growth process as a vector of boosting the demand for transport (quantity, type, location and mode). The second analytical perspective concerns investments in transport sector in connection with the mechanisms for setting the transport tariffs, which may influence the emergence of technological intensive clusters. In this article, I propose to highlight how transport infrastructure contributes to economic development and improves quality of life. As we assist in advancing the process of ”tertiaryisation” of the European economy, the applicative part of the study will aim to capture the correlation between the transport infrastructure and the number of tourists attracted in the EU member countries.

Key words*:* prosperity, transport infrastructure, quality of life, transport tariffs

Introduction

Development can be defined as an increase in the well-being of a society by improving social, political and economic conditions. Expected outcomes look at qualitative and quantitative aspects both in terms of human capital (income and level of education) and physical capital, such as infrastructure (utilities, transport, and telecommunication). If so far policies and strategies had as reference physical capital, the processes and phenomena that determine the evolution of society, now an equally important note is given to human capital. Therefore, there can be no "confrontation" between physical and human capital, as there is a permanent interaction between the two for economic development to be more than a quantitative evolution of the indicators (Galor and Moav, 2004). Infrastructure can not be efficient without operations and maintenance, while economic activities can not be deployed without infrastructure. High transactional services and operations involved in transport activities highlight the relationship between its physical and human capital needs (e.g. efficient logistics means both infrastructure and managerial experience).

Thus, the transport sector, a part of an economy, is also a common tool for development, especially in a global economy where opportunities have increased with the mobility of people, goods and information. High density transport infrastructure and highly connected networks are generally associated with high levels of development. When transport systems are effective, they provide opportunities and benefits with positive multiplier effects such as better market accessibility, employment and investment. If we are talking about a deficiency in the capacity and reliability of transport systems, there may be economic costs as a result of the reduction or disappearance of opportunities and a lower quality of life. In addition, the impact can also have unforeseen consequences.

Transport infrastructure – a pillar of prosperity

The two-way relationship between transport and economy

The impact of transport at the economic level takes various forms. The most important is the physical capacity to carry passengers and goods at the appropriate costs to support this mobility. This implies establishing routes that allow new or extensive interactions between economic entities. Equally important is the improvement of performance over time, especially reliability, but also the reduction of loss or damage, which implies a better use of transport goods so passengers and goods are carried faster and with fewer delays. Another impact concerns access to a wider market where economies of scale in production, consumption and distribution can be achieved (access to more resources and a larger market).

The economic importance of transport infrastructure can be analyzed both from a macroeconomic and microeconomic perspective. So, regarding the impact on the whole economy, transport and mobility are linked to a certain level of production, employment and income from the national economy. In many developed countries, transport accounts for between 6% and 12% of GDP. If logistics costs are included, the percentage may reach 25% of GDP. If we take into account only part of the economy, transport is closely linked to the producer, consumer and production costs. High revenue levels are associated with a higher share of transport expenditure in consumer spending, with an average cost of between 10% and 15% of household spending (Rodrigue, 2017).

Moreover, the added value and effects of transport services extend beyond what generates activity itself. For example, transport companies acquire some of the resources from local suppliers, which adds value and increases local employment. In addition, suppliers buy goods and services from other local businesses. On the other hand, households who earn from transport activity spend a share on local goods and services, which leads to additional jobs and added value locally. Thus, a circuit of the process is formed that implies a larger global impact than the original one.

At the same time, transport connects production factors into a complex network with producers and consumers relationships, resulting in a more efficient division of production, with comparative advantages and economies of scale. So, it increases space, capital and labor productivity through distribution efficiency and people's mobility.

Due to demographic pressures and urbanization, in developing economies there is a mismatch between limited supply and growing demand for transport infrastructure. While some regions know the development of transport systems, others are marginalized by a set of conditions where inappropriate transport plays an important role. Transport itself is not a sufficient condition for development, but the lack of transport infrastructure remains an impediment to economic development, through high transport costs, delays and supply chain disturbances. A low level of transport service affects the competitiveness of a region and economic activity, which has a negative impact on added value, employment and economic opportunities (Vickerman, 2012).

Transport investments and economic returns

It is assumed that investment in transport will generate economic returns, which in the long run will justify the initial commitment of capital (Banister and Berechman, 2001). Like most infrastructure projects, transport can generate an annual return of 5-20% of the capital invested, figures often advanced to promote and justify investment in transport infrastructure. In any case, investment in transport tends to reduce marginal profitability. While the initial investment tends to have a high return as it gives new mobility options, the more the system is developed, the more the additional investment will yield a lower return and at one point the marginal profitability can reach 0 or may even be negative. The error that may arise is the similar multiplying effect of the additional investment and initial investment, which results in a misallocation of capital.

Therefore, each transport infrastructure development project should be treated independently. Transport infrastructure is capital intensive fixed assets, being prone to inappropriate allocation and disinvestment, and can be associated with investment in welfare production rather than welfare consumption where services are concerned.

Many such projects are funded by public funds, so they can be the subject of lobbying, which leads to lower economic returns. Moreover, large projects, such as public transport, may have poor cost control mechanisms, thus exceeding the budget. The economic profitability of investments in transport infrastructure can be traced through the evolution of some indicators (e.g. transport prices and productivity) (Banister and Berechman, 2000).

Transport - an economic variable

Globalization and technological progress have caused economic development to be more dependent on space relations. Resources, capital, labor have led to increased mobility.

Transport gives access to market by facilitating the relationship between producers and consumers. Analysis of the importance and impact of transport on the economy focuses only on transport costs, which represent between 5% and 10% of the asset value. Transport is an economic factor for the production of goods and services, which, although it generates a small part of the input costs, are fundamental to their production. Regardless of the cost, no activity can be carried out without the intervention of the transport factor. Therefore, any magnitude of the change in cost, capacity and transport performance can trigger substantial effects on dependent economic activities (Anderson and van Wincoop, 2004).

Many positive economic changes take place with a modern transport infrastructure. Such improvements encourage geographical specialization, contributing to increased productivity and spatial interactions. Each economic entity seeks to produce with the most appropriate factors combination as long as transport modes are available to ease its activity, so regions tend to specialize where they have the greatest benefits.

Also, an efficient transport system that offers benefits of time, cost and reliability allows goods to travel long distances, thus access to larger markets, a larger scale of production and lower unit costs.

The transport efficiency also leads to the development of market potential for a particular product, thus increasing competition. More goods and services become accessible to consumers, encouraging quality and innovation.

The adjacent land to transport services is of greater value due to the utility it gives to various activities. Consumers are allowed greater access to retail goods and services, while residents can choose from more jobs, services and social networks, all reflected in the high land value (Docherty and MacKinnon, 2013).

Transport and tourism - an interdependence

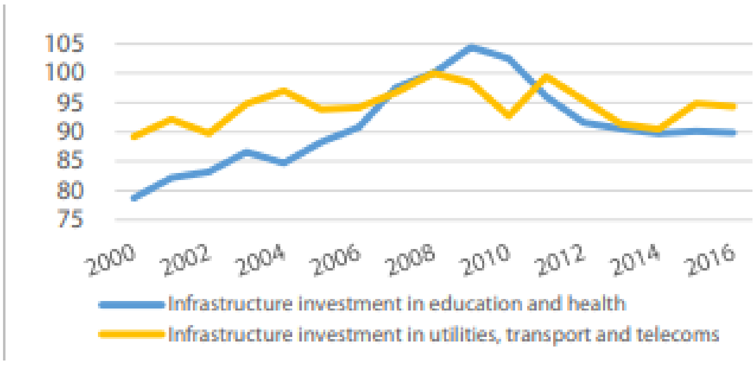
Transport infrastructure and tourism growth are closely connected. Tourism is a group of activities aimed at satisfying the needs of tourists during their journey and spending time in the chosen destination, and its development has a positive impact on the whole economy and social life. A well-developed transport infrastructure is necessary for tourism development, but it is not sufficient.

Transport infrastructure is a sine qua non condition for transport development, as traffic comprises a number of personal cars, and this makes the infrastructure an integral part of travel. Transport infrastructure does not always mean the accessibility of desirable destinations as long as it depends on the availability and organization of transport.

A journey is primarily an experience of a series of impressions. The market has a major role in creating this impact on the tourist. Under the current conditions of increasing competition on the tourism market there is the possibility of dissatisfaction for tourists who can invariably lead to their refusal to use the same products or services. It is easy to see the role transport plays in today's tourism, considering that time spent in vehicles occupies a significant part of the journey. In the past, the main purpose of the transport was to reach the destination as quickly as possible, disregarding the discomfort during the journey. Today, transport has a different role, achieving the following valences: 1 - accessibility of tourist destinations; 2 - mobility within tourist destinations; 3 - some types of transport are tourist attractions. Transport that provides accessibility for tourist destinations is connected to the main and interstate infrastructure.

An important correlation can be observed in the figure below, between infrastructure investment in education and health, and infrastructure investment in utilities, transport and telecoms, the main areas that people have access to and may bring prosperity and well being by achieving the level of satisfaction for each person.

Figure 1 Investments in infrastructure in real terms in the EU

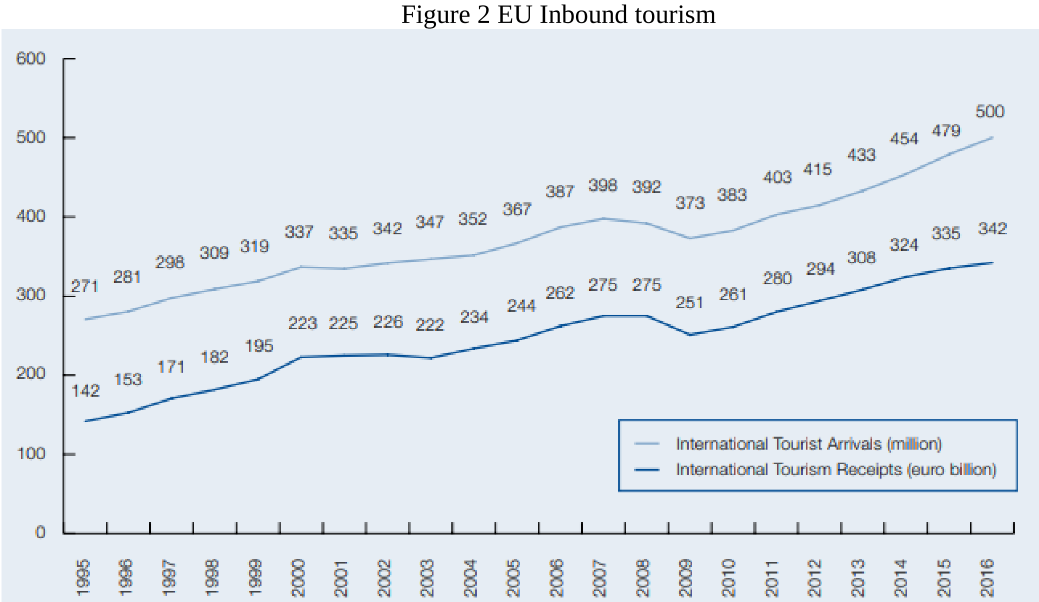


Source: Eurostat, Ioannis Zachariadis, European Parliamentary Research Service, 2018

As can be seen, the economic crisis has affected investments in transport, telecommunications and utilities infrastructure. Although they have fluctuated globally, investments remain well below the pre-crisis level.

Talking about the tourism within the EU, it has followed a growing trend, highlighting the importance of the infrastructure in a journey.

Figure 2 EU Inbound tourism



Source: World Tourism Organisation, European Union Tourism Trends, 2018

Except for the crisis year, the tourism has followed an increasing trend and there are premises that it will be countinously increasing, taking also into account the globalisation, the evolution of technology and so the development and evolution of transport infrastructure.

Conclusions

Economic growth is closely connected to the development of transport infrastructure as well as to management activities as decisions on how to use and operate transport systems are needed in order to increase benefits and reduce costs. So hard assets have to harmonize with the soft ones (work, management, information systems).

The link between transport infrastructure and economic development is a little more sensitive, as in some situations it appears to be a catalyst for economic growth, while in others economic growth puts pressure on existing transport infrastructure and causes additional investment. Transport markets and infrastructure networks are considered to be key drivers in promoting sustainable development by improving accessibility and opportunities for less developed regions and disadvantaged social groups.

Economic development is also achieved through job creation, many of them being associated with the evolution of transport infrastructure. Economic entities make decisions about products, markets, costs, locations, prices, based on transport services, availability, reliability and capacity.

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Očekivanja studenata od kurseva visokoškolskih centara za razvoj karijere - slučaj Fakulteta za inženjerski menadžment

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Apstrakt: Visokoškolski centri za razvoj karijere postaju sve važniji element organizacije visokoškolskih ustanova širom sveta, a Republika Srbija ne predstavlja izuzetak. U Srbiji je, međutim, zabeležen nedostatak aktivnosti studenata u razvoju veština za uključivanje u tržište rada, kao i veština potrebnih na tržištu rada na različitim poslovima (tzv. prenosive veštine - *transferrable skills*). Razvijanje tih veština kod studenata postaje važan zadatak visokoškolskih centara za razvoj karijere. U procesu razvoja prakse karijernog vođenja i savetovanja na visokoškolskim ustanovama u Srbiji, na Fakultetu za inženjerski menadžment je uveden obavezni kurs *Upravljanje karijerom* sa ciljem da studenti razvijaju veštine potrebne za ulazak na tržište rada. U prvoj godini sprovođenja kursa, studenti su pre i posle pohađanja ovog kursa imali prilike da u vidu ankete iskažu svoja očekivanja od Centra za razvoj karijere. Očekivanja studenata od Centra su se promenila posle pohađanja kursa i postali su spremniji za aktivniju ulogu u upravljanju sopstvenom karijerom. Stoga je neophodno da visokoškolske ustanove u Srbiji uvedu obavezne programe čiji je cilj razvijanje karijere svih studenata.

Ključne reči: Karijera, razvoj karijere, visokoškolski centri za razvoj karijere, studenti.

The students' expectations from higher education career development centres' courses – Case of the School of engineering management

Abstract: Higher education career development centres are becoming all the more important elements of higher education institutions around the world and the Republic of Serbia. In Serbia, researchers have noticed the lack of activity among the students regarding development of skills needed for the job market with the emphasis on so called *transferrable skills*, needed on any job or a career. As a contribution to the career counselling practice in higher education institutions in Serbia, School of Engineering Management introduced obligatory course for the students - Career Management - in order to assist the students to develop skills needed for the entrance to the job market. In the first year of the course implementation, the students had the opportunity to express their expectations from the Centre through a survey before and after attending the course. The students' expectations from the Centre have changed after attending the course and the students have become ready for more proactive role in managing their own career. The students also started to understand better the importance of acquiring transferable skills for strengthening their own employability. It is necessary for higher education institutions in Serbia to introduce compulsory career development programs for all students.

Key Words: Career, career development, higher education career development centres, the students.

1. Introduction

Higher education centers for career development, based on the theory of career development and the theory and practice of career guidance and counseling, have become an increasingly important element of higher education institutions in the most developed countries of the world since the end of the 20th century. Career counselors provide the students with assistance in acquiring the skills needed to effectively plan careers and make career decisions. They encourage students to understand how career choices make a difference in life and help create realistic job and career expectations (Greenhouse et al., 2010: 64-77). Niles and Harris-Baulsby have pointed out that the most important tasks of career counselors working with the students include assisting students in learning how to develop a right image of their own interests, values, motivation, knowledge, skills, and abilities; how to understand existing professions; how to improve, maintain, and refine the knowledge and skills required for a particular profession; how to participate in lifelong learning programs and how to effectively seek employment (Niles et al., 2009: 11), which s embedded in the programs of many higher education institutions (Chin, et al., 2018).

In the United States and the United Kingdom in the early 21st century, almost all higher education institutions through career development centers have provided career guidance and counseling services for the students (Niles et al., 2009; Neary, et al., 2015). The impact of the economic crisis since 2008 has led the higher education institutions in the US and UK to conclude that career guidance and counseling programs must include the students from the first year of study. Centers for career development in the 21st century are becoming a standard in higher education institutions in other developed countries in the world as well. The main characteristics of the finest higher education career centers are: providing a variety of programs, engaging the first year students, assisting the students in choosing a major, preparing students to seek employment, and acquiring the competencies needed to better understand and face the challenges of the job market (Amundson et al., 2009; Dey and Cruzvergara, 2014). The same principles should be followed by higher education centers for career development in Serbia.

The first University Career Development Centers in Serbia have been established in 2006 and 2007 at state and private universities and colleges. Know-how has been based on the experience of advisers in the fields of career development, education, and human resource management; on foreign literature on career development and career counseling; as well as on training programs provided by USAID projects as well as EU Tempus projects (Tempus, 2012). The still current Career Guidance and Counseling Strategy in the Republic of Serbia, adopted by the Government of the Republic of Serbia in 2010 (therefore, after the establishment of the first higher education centers for career development), has emphasized that career guidance and counseling programs for young people aged 19 to 30 should include informing, advising, guiding, and making career decisions in order to ensure that young people make realistic career choices, nad that they should focus on several areas: the individual's personal development (goal setting, activities to gain further knowledge and skills, quality identification of career opportunities); exploring learning and employment opportunities (gathering and selecting information, evaluating potential career paths, etc.); planning and managing one's own career (such as assuming one's own responsibility) (Government of the Republic of Serbia, 2010).

2. The case of the School of Engineering Management

Since it's establishment, the School of Engineering Management has, on the basis of the contemporary theory and practice of career guidance and counseling of the students and the Strategy of career guidance and counseling in the Republic of Serbia (2010) adopted by the Government of the Republic of Serbia, identified the students' career development as one of the key components of the mission and the vision of the School. Thus, establishing a higher education centre for career development through career guidance and counseling programs has been one of the foundations of the School. The core objective of this centre has been based on the premise of enabling the students to develop their potential for successful inclusion in the contemporary labour market. Figler (2007: 18) has emphasized that the first and key goal of a career counselor is to assist the client in taking responsibility for his or her own career development and for making personal career decisions, which is one of the cornerstones of building this centre.

In the development of the Career Development Centre of the School of Engineering Management, the focus has been on the development of the so-called transferable skills, or those skills that are required for successful study and work in any position in the future. According to Schutt (2008: 6) these include: teamwork, research and data analysis, problem solving, reporting, leadership, change management, innovations, etc.). Many studies in the Republic of Serbia have found that young people lack the employability skills - a combination of skills, attitudes and behaviors required to effectively seek work and effectively do their jobs, regardless of occupation, but also lacking independent activity in acquiring the skills needed to enter the labour market (Citizens' Initiatives, 2010: 18; Arandarenko et al., 2012).

The team of the Career Development Centre have concluded during the development of the program (2010-2012) that it is necessary to include in the curriculum a compulsory program for the students of the first year, which targets timely development of the career of the students like the programs introduced at various higher education institutions at varius periods (Lucy, 2017). Thus, in 2012, a 15-week (one semester) career management course has been created. The course program has consisted of two parts:

- The first part focuses on the academic development of students (writing essays, scientific papers, research methodology, referencing);
- The second part is intended for the students' professional development (personal assessment, goal setting, drafting of CV, drafting of motivation letters, behaviour at job interviews, etc.).

The ultimate objective has been to assist the students in acquiring these skills in order to prepare for entry into the labour market, rather than providing them with ready-made solutions.

3. Research

The Scope of Study and Data Collection

Like in the previous years, in the school year 2018/19, the Career Management course has been given to the first year students. After the introductory presentation, like in prevous yesrs, the students have had the opportunity to give their opinions on the program presented and to contribute their views on the role of the Career Development Centre. Most students involved in the discussion like the previous generations expressed deep-seated fears about their employability and developments in the job market. The students' expectations that the School and the Career Development Centre will "give" them adequate knowledge, skills and abilities needed in the labour market have been expressed very strongly, but without understanding of the importance of active participation of the individual student in acquiring skills that would make them more competitive in the labour market. This discussion has been the basis of the surveying the students' expressions of their expectations of Career development centres at the beginning of the Career Management course and after the Career Management course in order to analyze whether their expectations have changed upon obtaining and adopting many useful career development information and trainings.

At the beginning (October 2018) and at the end (February 2019) of the course, the students have been given a questionnaire within which they could express their expectations of the Career Development Centres. The same number of the students like in the previous, similar, study (Ilić-Kosanović, 2018) 69 students (N = 69) have been surveyed, in conditions of complete anonymity (the questionnaires have been placed in the reading room). In addition to demographic questions, the questionnaire have consisted of six close-ended questions, or statements, with have offered answers in the form of a five-point Likert scale (1 – I disagree completely, 2 – I somewhat disagree, 3 – I am neutral, 4 – I somewhat agree, 5 – I completely agree).

As a basis for the research, two groups of hypotheses have been formed, which, generally, determined the degree of student expectations from the career development centres regarding the assistance of the Development Centres in finding job opportunities and in developing additional knowledge and skills needed in the labor market. These hypotheses have formally been formulated as follows:

Group A hypotheses relate to the students' expectations that the Career Development Centre will find them a job, internship, or a volunteering opportunity:

- HA1: The students expect the Career Development Centre to find them a job.
- HA2: The students expect the Career Development Centre to find them an internship.
- HA3: The students expect the Career Development Centre to find them a chance to volunteer.

Group B hypotheses relate to the students' expectations that the Career Development Centre will assist them in developing additional knowledge and skills:

- HB1: The students expect the Career Development Centre to help them develop additional knowledge and skills needed in the job market.
- HB2: The students expect the Career Development Centre to teach them the skills they need to find a job.
- HB3: The students expect the Career Development Centre to teach them how to write a CV.

Based on the hypotheses, research questions have been formulated as follows:

RQA1	I expect Career Development Centre to find me a job.
RQA2	I expect Career Development Centre to find me an internship.
RQA3	I expect Career Development Centre to find me a chance to volunteer.
RQB1	I expect Career Development Centre to help me develop additional knowledge and skills needed in the job market.
RQB2	I expect Career Development Centre to teach me the skills they need to find a job.
RQB3	I expect Career Development Centre to teach me how to write a CV.

Methods

This paper presents the results obtained by determining the degree and manner of correlation (individual) of individual respondents' answers, with the so-called Pearson's Product Moment Correlation Coefficient. For the formal testing of all the above hypotheses, *Student's t test* of equality of expectations of the surveyed students has been used before and after attending the career management course, which has determined the degree of significance of differences of their answers before and after attending the course. By calculating the differences of the observed means, the way in which the structure of their responses itself has been changed, thereby determining the validity of the hypotheses formulated above. Statistical data processing has been performed within the relevant modules of the SPSS (Statistical Program for Social Sciences) package.

Results

Table 1 shows the basic statistical indicators that relate to the average values of the students' expectations that the Career Development Center will find them a job. Before attending the Career Management course, the students' expectations have been expressed to a considerable extent (the average value of their answers has been as high as 4.13), and then dropped to only 2.59. Thus, there is a pronounced tendency of decreasing this type of the students' expectations, which is statistically confirmed. Specifically, the relatively high realized value of the test statistic t = 8,616 (with the significance level p = 0), confirms the conclusion that there is a statistically significant difference, but also a decrease in student expectations before and after attending the Career Management course. Finally, the negative value of *Pearson's simple linear correlation coefficient* (r = -0.126) indicates that there is a negative but very weak correlation between the responses of the surveyed students before and after attending the course. In this way, hypothesis A1 is formally confirmed.

Table 1. *Student's t test* of equality of means of the students' expectations for the Career Development Center to find them a job

Survey	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	p	r	95% Confidence Interval of the Difference	
									Lower	Upper
T1	4.13	0.922	0.111	69	1.54	8.616	0.000	-0.126	1.180	1.892
T2	2.59	1.048	0.126	69						

Table 2 presents basic comparative statistical parameters that relate to the students' expectations that the Career Development Centre will find them a professional internship. The values obtained, and therefore the corresponding conclusions, are very similar to those in the previous case. The students' expectations before attending the Career Management course have been very pronounced (average response value has been 4.16), only to drop to 3.20 after attending the course. The tendency to decrease this type of expectations, although somewhat less pronounced than in the previous case, is also statistically significant here, and it is formally confirmed by the *Student's t test*. The (again) relatively high value of the corresponding test statistic t = 4.646 has been obtained, with the same significance level p = 0. In this way, it is confirmed that there is a statistically significant difference, i.e. reducing this type of the students' expectations.

Table 2. *Student's t test* of equality of means of expectations of the students for the Career Development Centre to find them professional practice

Survey	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	p	r	95% Confidence Interval of the Difference	
									Lower	Upper
T1	4.16	1.158	0.139	69	0.96	4.646	0.000	-0.127	0.546	1.367
T2	3.20	1.119	0.135	69						

Here, too, a negative, relatively low correlation of their responses is present, because the value of Pearson's simple linear correlation coefficient (r = -0.127) is almost identical to the previous one. Thus, hypothesis A2 is formally confirmed in this case as well.

Table 3 provides basic statistical indicators of the students' expectations that the Career Development Centre will find them an opportunity to volunteer. Here, the expectations of students before attending a career management course were slightly less pronounced than in the previous two cases (the average of their answers was 3.59), and after their attendance it would drop to 2.59. However, the tendency to decrease this type of expectation is also statistically significant here, as evidenced by the relatively high value of the corresponding test statistic t = 4.422 (the significance level is again p = 0). Thus, it has formally been confirmed that there has been a statistically significant difference as well as a decrease in students’ expectations. Note that a negative but slightly more pronounced linear correlation of the students’ responses is present (Pearson's simple linear correlation coefficient is r = -0.308). Therefore, in this case, we have confirmed hypothesis A3.

Table 3. *Student's t test* of equality of means of the students' expectations that the Career Development Centre will find them an opportunity to volunteer

Survey	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	p	r	95% Confidence Interval of the Difference	
									Lower	Upper
T1	3.59	1.321	0.159	69	1.00	4.422	0.000	-0.308	0.549	1.451
T2	2.59	0.990	0.119	69						

Next, Table 4 presents basic statistical indicators of the students' expectations that the Career Development Centre will help them develop additional knowledge and skills needed in the job market. Unlike the previous ones, the expectations of students before attending the Career Management course (response average 4.07) have been only slightly higher than expectations after attending the course (average response value 3.87). This has also been confirmed by *Student's t test*. In this case, the corresponding value of the test statistic is t = 1.178 and is less than the critical value of 1.666 (with the significance level p = 0.243> 0.05). So, with a risk level of 5%, we claim that there is no statistically significant difference (decrease) in the students’ expectations. Finally, although there is also a negative correlation between the students’ responses before and after attending the course, it is statistically almost insignificant (r = -0.021). Consequently, hypothesis B1 is not confirmed in this case.

Table 4. *Student's t test* of equality of means of the students' expectations for the Career Development Center to help them develop additional knowledge and skills needed in the job market

Survey	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	p	r	95% Confidence Interval of the Difference	
									Lower	Upper
T1	4.07	1.129	0.136	69	0.20	1.178	0.243	-0.021	-0.141	0.547
T2	3.87	0.856	0.103	69						

Similar conclusions can be drawn in the case of the students' expectations that the Career Development Centre will teach them the skills they need to find a job. As can be seen in Table 5, here, too, the expectations of students before attending a career management course (response average 4.23) are slightly higher than expectations after attending the course (response average is 4.06). The realized value of *Student's test* statistics is t = 1,136, ie. it is again less than the critical value of 1.666 (with a significance level of p = 0.260> 0.05). So, in this case, we also claim that there is no statistically significant difference (decrease) in the students' expectations that the Career Development Centre will teach them the skills they need to find a job. Finally, the negative correlation of the students' responses related to this expectation before and after attending the course is again statistically insignificant (r = -0.018). Thus, hypothesis B2 is not formally confirmed in this case either.

Table 5. *Student's t test* of equality of means of students' expectations that the Career Development Centre will teach them the skills they need to find a job

Survey	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	p	r	95% Confidence Interval of the Difference	
									Lower	Upper
T1	4.23	1.002	0.121	69	0.17	1.136	0.260	-0.018	-0.32	0.479
T2	4.06	0.765	0.092	69						

Table 6 presents basic statistical indicators of the students' expectations that the Career Development Centre will teach them how to write a professional CV. In this case, the expectations of the students before attending a career management course (response average 4.32) are somewhat higher than expectations after attending the course (response average 3.99). The realized value of *Student's test* statistics here is t = 2.145, ie. slightly "exceeds" the critical test value of 1.666 (with a significance level of p = 0.0360 <0.05), while the negative correlation of the students' responses to this expectation before and after attending the course is again statistically almost insignificant (r = -0.012). So, in this case, we argue that there is a statistically significant difference (decrease) in the students' expectations. This means that hypothesis B3 is formally confirmed.

Table 6. *Student's t test* of equality of means of students' expectations that the Career Development Centre will teach them to write a professional CV

Survey	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	p	r	95% Confidence Interval of the Difference	
									Lower	Upper
T1	4.32	0.947	0.114	69	0.33	2.145	0.036	-0.012	0.023	0.643
T2	3.99	0.866	0.104	69						

4. Conclusion

As can be seen from the research, the students of the School of Engineering Management had, before attending the Career Management course, a clear expectation that the Career Development Centre would find them a job and professional internship without understanding their own, active, role in the process, while those expectations were reduced at the end of the course. Similarly, the expectations have been expressed when it came to finding opportunities to volunteer and assisting in writing a CV. In contrast, the expectations regarding assistance in developing additional knowledge and skills needed in the labor market and in finding a job, have not been significantly differently expressed before and after attending the course.

The overall conclusion is that students' expectations of higher education centres for career development changed after attending the Career Management course and that students became more prepared for an active role in managing their own careers. Therefore, it is necessary to introduce programs that would involve working with the students from the first yer of the study throughout all years of study to be ready to take on a "major role" in the process of managing their own careers. It is necessary to encourage higher education institutions in Serbia to introduce mandatory career management courses and other career guidance and counseling programs for career development centers for all students in order to facilitate their employability. It is necessary to create the conditions and means to involve students in such programs from the first year of study, which enables timely work with the students, which means acquiring knowledge, skills and abilities for successful integration into the labor market and career management. This implies a more active role of the state, when it comes to state higher education institutions and also the owners of private universities and colleges in order to obtain the necessary technical and other conditions and financial resources.

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Guidelines for the Preparation of Papers for Publication in the Serbian Journal of Engineering Management

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Keywords: 3-5 keywords for indexing and search purposes

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The paper should be written using MS Word for Windows (on Serbian Cyrillic, Latin or English – UK keyboard). The length of work should not be more than 10 pages including text, diagrams, tables, references, and appendices.

The format is **A4**. Use **2 cm** for the lower and upper margin and **2.5 cm** for the left and right margin. The spacing within one paragraph should be one (single), while the spacing between paragraphs is double. To format the text, it is recommended to use font Times New Roman.

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In the first line of the first page the title should be written in Serbian language (16 pt). Under the title of the paper the spaces for name(s) of the author and the names of the author's institutions should be indicated as specified and aforementioned in this Guideline. After the space for the institution of the last author, leave one blank line and write the short summary (10 pt) in Serbian. After the summary, provide an overview of key words. After the paper title you indicated, include the summary and key words in the Serbian language, whereas they should be indicated in English like above.

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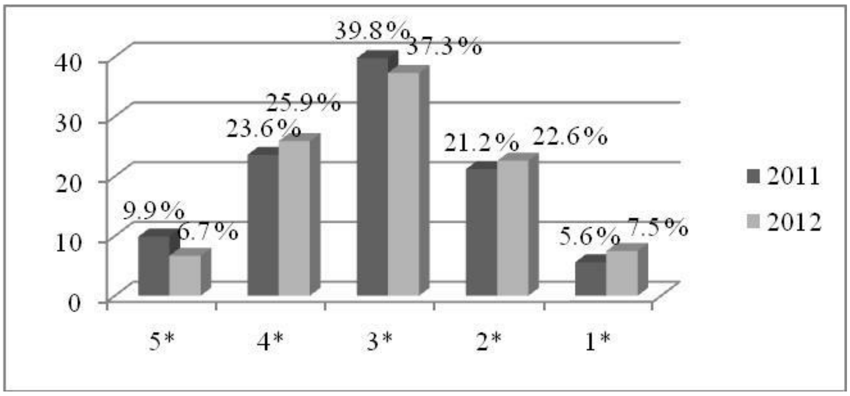
All illustrations, regardless of whether they are diagrams, photographs or charts are referred to as images. The name and number of images should be displayed as centred.

Figure 1: Accommodation units according to the structure of hotel capacities in 2011 and 2012, written in the form of percentage



Source: (The Ministry of Finance and Economy, 2013)

The title and number of the table should be presented above the table as centred

Table 1: Accommodation units according to the structure of hotel capacities in 2011 and 2012, written in the form of percentage

Category	**2011**	**2012**	**Number of accommodation units (2011)**	**Number of accommodation units (2012)**
5*	**9,9**	**6,7**	1452	990
4*	**23,6**	**25,9**	3486	3911
3*	**39,8**	**37,3**	5895	5636
2*	**21,2**	**22,6**	3102	3420
1*	**5,6**	**7,5**	1133	1132
total	100	100	15068	15089

Source: (The Ministry of Finance and Economy, 2013)

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$$PVo = \frac{FVn}{(1+i)^{n}} \qquad (1)$$

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Obrazac za pripremu radova za objavljivanje u časopisu
Serbian Journal of Engineering Management

Naslov rada na srpskom jeziku

Ime Prezime[9]*, Ime Prezime[2], Ime Prezime[3] [ostavite u ovoj verziji prazno za potrebe recenzije]

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Apstrakt: Ovaj dokument predstavlja obrazac za formatiranje radova tako da izgledaju kao da su već spremni za štampu. Sažetak predstavlja kratak informativni prikaz sadržaja članka koju čitaocu treba da omogući brzu i tačnu ocenu njegove relevantnosti. Autori treba da obrazlože ciljeve istraživanja ili navedu razlog (razloge) zbog koga pišu članak. Zatim, potrebno je da opišu metode korišćene u istraživanju i ukratko opišu rezultate do kojih su došli u istraživanju. Sažetak treba da sadrži od 100 do 250 reči.

Ključne reči: 3-5 ključnih reči za indeksiranje i pretraživanje

Title of Paper in English

Abstract: This document presents a template for preparing the print-ready papers that will be included in the Serbian Journal of Engineering Managment. The abstract briefly summarizes the article and gives the reader the opportunity to assess it's relevancy. The authors should elaborate the goals of the research or state their reason (reasons) for writing the paper. It is additionally required for them to describe the methods used during the research and give a brief description of the results and conclusions of the research. The abstract should be between 100 and 250 words in lenght.

Keywords: 3-5 keywords

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Rad pisati koristeći MS Word za Windows (tastatura za srpsku ćirilicu, latinicu ili engleski jezik - UK). Dužina rada treba da bude najviše 10 strana uključujući tekst, slike, tabele, literaturu i ostale priloge. Format stranice je **A4.** Koristite **2 cm** za donju i gornju marginu, a **2,5 cm** za levu i desnu marginu. Razmak između redova u okviru jednog pasusa je jedan, dok je razmak između paragrafa dvostruki. Za formatiranje teksta preporučuje se korišćenje fonta **Times New Roman.**

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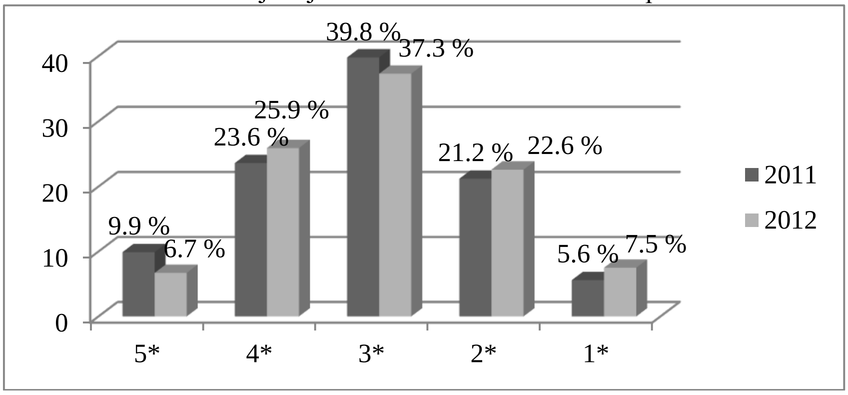
Numerisane podnaslove prvog nivoa treba formatirati korišćenjem fonta 12 pt boldovano, a podnaslove drugog nivoa 10 pt boldovano. Tekst, kao i spisak literature treba formatirati korišćenjem fonta 10 pt.

3. Grafički i tabelarni prikazi i formule

Sve ilustracije, bez obzira da li su dijagrami, fotografije, grafikoni nazivaju se slike. Naziv i broj slike treba prikazati na sredini reda iznad slike.

Slika 1: Procentualno učešće smeštajnih jedinica u strukturi hotelskih kapaciteta u 2011. i 2012. godini



Izvor: (Ministarstvo finansija i privrede, 2013)

Naziv i broj tabele treba prikazati iznad tabele na sredini reda.

Tabela 1: Procentualno učešće smeštajnih jedinica u strukturi hotelskih kapaciteta u 2011. i 2012. godini

Kategorija	**2011.**	**2012.**	**Broj smeštajnih jedinica (2011)**	**Broj smeštajnih jedinica (2012)**
5*	**9,9**	**6,7**	1452	990
4*	**23,6**	**25,9**	3486	3911
3*	**39,8**	**37,3**	5895	5636
2*	**21,2**	**22,6**	3102	3420
1*	**5,6**	**7,5**	1133	1132
ukupno	100	100	15068	15089

Izvor: (Ministarstvo finansija i privrede, 2013)

Pošaljite svoj rad, uključujući tabele, slike itd, kao jednu datoteku. Pored toga, treba dostaviti sve slike i tabele (koje se unose u crno-beloj tehnici) kao posebne fajlove u JPF ili TIFF formatu sa najmanje 300dpi rezolucije.

Formule treba centrirati na stranici sa numeracijom, kao u narednom primeru. Preporučuje se formatiranje redova sa formulama u Microsoft Word-u (MathType).

$$\mathrm{PVo} = \frac{\mathrm{FVn}}{(1+\mathrm{i})^{\mathrm{n}}} \qquad (1)$$

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