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CONTENT/SADRŽAJ

A Message from the Editor-in-Chief

Serbian Journal of Engineering Management is a new scientific journal, published by School of Engineering Management and Society of Engineering Management of Serbia. 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: http://fim.rs/centri-za-razvoj-i-saradnju/izdavacka-delatnost/naucno-strucni-casopis/.

Prof. Dr. Vladimir Tomašević, FRSA

Reč urednika

Serbian Journal of Engineering Management je nov naučno-stručni časopis, koji izdaje Fakultet za inženjerski menadžment i Društvo inženjerskog menadžmenta Srbije. 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: http://fim.rs/centri-za-razvoj-i-saradnju/izdavacka-delatnost/naucno-strucni-casopis/.

Prof. dr Vladimir Tomašević, FRSA

Metoda klasterizacije u sektoru modne industrije u cilju podizanja kvaliteta poslovanja za donosioce odluka

dr Stefana Janićijević[1]
dr Svetlana Milutinović[2]
Nenad Avlijaš[3]

[1]ASW Inženjering, Takovska 45A, stefana@mi.sanu.ac.rs
[2] Telekom Srbija, Dubrovačka 35, svetlanamilu@gmail.com
[3]ASW Inženjering, Takovska 45A, nenad.avlijas@asw.eu

Apstrakt: Rad prikazuje uticaj pametnih tehnologija na donošenje odluka u kompanijama širom sveta. Fokusiran je na pružanju podrške modnoj industriji i marketinškim odlukama baziranim na pristupu podataka kroz Data Mining (DM). Današnji korisnici imaju tako raznovrsne ukuse i želje da ih nije moguće grupisati u velike i homogene populacije kako bi razvili marketinške strategije. Zapravo, svaki korisnik želi da bude servisiran prema svojim individualnim i jedinstvenim potrebama Prema tome, prelazak sa masovnog marketinga na tržište odnosa jedan-na-jedan zahteva od donosilaca odluka da daju posebne strategije za svakog pojedinačnog korisnika na osnovu njegovog profila.

Tehnologija budućnosti pa i sadašnjosti je veštačka inteligencija koja se primenjuje uspešno u svim sferama poslovnih procesa. Jedna od najčešće korišćenih metoda veštačke inteligencije je metoda pametne klasifikacije, odnosno klasterovanja, bez uticaja pristrasnih faktora čoveka. Za istraživanje je izolovana baza iz maloprodajnog sektora gde se posmatrala istorija kupovina lojalnih korisnika i gde se primenio algoritam klasterovanja iz oblasti inteligentnih sistema ili veštačke inteligencije.

Ključne reči: donošenje odluka, marketing, menadžment, veštačka inteligencija, modna industrija

Method of Clustering in Fashion Industry Sector with the Aim of Raising the Quality of Business for the Decision Makers

Abstract: The paper presents the influence of smart technology on decision making in companies around the world. It`s focused on the problem of supporting fashion industry and marketing decisions based on Data Mining (DM) approaches. Today's customers have such a varied tastes and preferences that it is not possible to group them into large and homogeneous populations to develop marketing strategies. In fact, each customer wants to be served according to his individual and unique needs. Thus, the move from mass marketing to one-to-one relationship marketing requires decision-makers to come up with specific strategies for each individual customer based on his profile.

The technology of the future and the present is artificial intelligence that is applied successfully in all spheres of business processes. One of the most commonly used methods of artificial intelligence is the method of smart classification, i.e. clustering, without the influence of biased factors of men. The research is an isolated base from the retail sector where the history of buying loyal customers was observed and where clustering algorithm applied in the field of intelligent systems or artificial intelligence.

Key words: decision making, marketing, management, artificial intelligence, fashion industry

Introduction

Modern society, whose main characteristic is data, has been in the Internet revolution for several decades now. Companies such as Google, Facebook, Amazon, Microsoft, who first realized this, took the world's first development and profits and became the state-of-the-art company that everyone sees. The methodology of data warehousing and manipulation is extremely important as well as the methodology of data interpretation. This analytics is not just a presentation in spreadsheets, but it is a complete communication technology with supergoortics and supercomputers, in combination with sensors, cloud, robotics, etc. Data research dates back to the beginning of the twentieth century with the first development of computing, then caused by wars of research turning to patches such as cryptography and logic.

The next point in history that is significant for the development of business data is the 70s and 80s of the last century. Nevertheless, it is worth mentioning recent sources such as McKinsey's work from the 2012 World Economic Forum in Davos, Switzerland, where he presented a survey titled "Big Data, Big Impact". After the aforementioned work, Barack Obama's Cabinet proclaimed the Big Data Initiative for which $ 200M was allocated and where institutions such as the Academy, the Government, NGOs and private corporations were invited to work on exploring key points on the big data.

Today, the situation is such that data takes an essential role in people's lives. The term Big Data has gone down in history and now the brief data of all forms is called Data.

There are three relevant terms in science and technology that are direct participants in modern marketing and decision making. It is almost unthinkable to create a successful business in the future without the following three components [1]:

- Data mining (DM) - the discipline of As the purpose of modern business is growth in every direction, the demands placed on new technologies are becoming more and more challenging discovering patter in large data sets; baseline for analysis of all types in structured and unstructured data; It is based on database systems and statistics
- Machine Learning (ML) - discipline of using algorithms that create predictions from historical data, whereby, depending on the amount of historical data, the computer trains to be independent
- Artificial Intelligence (AI) - a broad discipline that includes data mining and machine learning; uses processes from these disciplines to describe the characteristics of human intelligence and at some point with sufficiently technologically developed societies the question of the role of traditional marketing in business is posed.

Fashion industry and decision making

Fashion is a major global industry. The global apparel market is valued at between US$2.4 trillion2/ and US$3 trillion and accounts for 2 percent of the world's Gross Domestic Product (GDP). 57.8 million People are employed in clothing and textiles worldwide – 24.8 million of those in apparel manufacture. [2]

Digital technologies reshape markets and value chains for fashion content and information, leading to an opportunity for innovative businesses to create value added services, applications and products. ICT forms the enabling element that brings to market these services, applications and products across all sectors through production, distribution and e-commerce. The life cycle of fashion products becomes shorter in recent years due to the fierce market competition environment. Short life cycles, high volatility, low predictability, and high impulse purchasing is being appointed has characteristics of fashion industry. The data that companies collect about their customers is one of its greatest assets. However, companies increasingly tend to accumulate huge amounts of customer data in large databases and within this vast amount of data are all sorts of valuable information that could make a significant difference to the way in which any company run their business, and interact with their current and prospective customers and gaining competitive edge on their competitors. [3] Global markets demand innovation.

DM is a very powerful tool that should be used for increasing customer satisfaction providing best, safe and useful products at reasonable and economical prices as well for making the business more competitive and profitable. A clustering algorithm assigns data points to different groups, some that are similar and others that are dissimilar. The use of clustering involves placing data into related groups typically without advance knowledge of group definitions. Companies can utilize DM techniques to extract the unknown and potentially useful information about customer characteristics and their purchase patterns DM tools can, then, predict future trends and behaviours, allowing businesses to make knowledge driven decisions that will affect the company, both short term and long term. The identification of such patterns in data is the first step to gaining useful marketing insights and making critical marketing decisions. [4]

The concept of applied statistics in the sales sector

The first question that concerns business and the data is - How to use Data Analytics to increase the shareholder value?

Consumer society based business relies on various media that serve as a channel for data integration, where both structured and unstructured data are rapidly growing day by day. Companies have billions of numerical records, demographics, records from social networks, textual records, video and image records, etc. Such a conglomerate base is a challenge for successful business that balances between strategy, marketing, structures, and algorithms. The business that first sees alarms, anomalies, rules, and results in data has the lead in an everlasting competition between the competitions.

Cluster analysis or clustering is the task of grouping customers in such a way that customers in the same cluster group are more similar to customers in other groups. Customers in the same clusters share features that lead to a similar product group or similar service group.

Algorithms as mathematical concepts are aimed at theoretical grounding, however, their expansion comes only after application in the economy and industry. The science of data that has evolved over the years gets its shape only when it is applied to concrete datasets and when results that yield success on it are seen.

Many algorithms are developed for the benefit of data science; it is worth mentioning only the most basic groups: Clustering, Logistic regression, Linear models, Support vector machines, decision trees, neural networks, etc.

This paper presents clustering. Clustering is one of the methods of unexpected learning that allows clustering of instances into groups, where the number and size of groups is not known in advance. The essence of clustering is to create as homogeneous groups as possible as heterogeneous among themselves. Clustering goals are a better understanding of consumer behaviour, sales campaign planning, customer retention, optimization of marketing costs, quality engagement of customers through appropriate channels and impact on consumer behaviour. The clustering information can be used to "tag" customers in the overall database. Customer clustering uses purchase transaction data to track buying behaviour and then create new business initiatives based upon findings, like sales campaigns and customer retention. Cluster analysis is one of the most important segmentation methods and it has long been the dominant and preferred method for market segmentation. [5] Therefore, clustering methods are commonly used in marketing for the identification and definition of market segments that become a focus of a company´s marketing strategy. [6] Traditionally, marketers must first identify customer cluster using a mathematical mode and then implement an efficient campaign plan to target profitable customers. [7]

Applications of Clustering

Clustering has a large number of applications spread across various domains. Some of the most popular applications of clustering are:

- Recommendation engines
- Market segmentation

- Social network analysis
- Search result grouping
- Medical imaging
- Image segmentation
- Anomaly detection

Customer clustering is the most important data mining methodologies used in marketing and customer relationship management (CRM). Customer clustering would use customer-purchase transaction data to track buying behaviour and create strategic business initiatives.

Being part of a cluster allows companies to operate more productively in sourcing inputs; accessing information, technology, and needed institutions; coordinating with related companies; and measuring and motivating improvement. [8]

Competition in today's economy is far more dynamic. Companies want to keep high-profit, high-value, and low-risk customers. This cluster typically represents the 10 to 20 percent of customers who create 50 to 80 percent of a company's profits. A company would not want to lose these customers, and the strategic initiative for the segment is obviously retention. A low-profit, high-value, and low-risk customer segment is also an attractive one, and the obvious goal here would be to increase profitability for this segment. Cross-selling (selling new products) and up-selling (selling more of what customers currently buy) to this segment are the marketing initiatives of choice. [9]

K Mean algorithm

Clustering is widely used method which includes huge number of algorithms. K Means algorithm was applied for the purpose of the research.

K Mean algorithm is a part of the Centroid method.

These are iterative clustering algorithms in which the notion of similarity is derived by the closeness of a data point to the centroid of the clusters. K-Means clustering algorithm is a popular algorithm that falls into this category. In these models, the number of clusters required at the end has to be mentioned beforehand, which makes it important to have prior knowledge of the dataset. These models run iteratively to find the local optima. [10]

Given a set of observations (x_1, x_2,…,x_n) where each observation is a d-dimensional real vector, k-means clustering aims to partition the n observations into k ($\leq n$) sets $\mathbf{S} = \{S_1, S_2,…,S_k\}$ so as to minimize the within-cluster sum of squares (WCSS).

Formally, the objective is to find:

$$arg\,min_S \sum_{i=1}^{k} \sum_{x \in S_i} \| x - m_i \|^2 = arg\,min_S \sum_{i=1}^{k} | S_i | \, Var \, S_i$$

where m_i is the mean of points in $\mathbf{S_i}$ [9]

Methodology of research

Research was developed in ASW Engineering Company in Belgrade, Serbia, in Machine Learning department. The survey was carried out on the test set from the textile company's sales sector in the period from 2009 to 2017 years. On that occasion, the number of 1800 loyal customers (consumer participants) was isolated, out of which 500 significant (active) loyal customers were isolated. The number of purchases made in that period amounted to 57,100, while the total turnover per account of the account customers amounted to 1.600.000€.

- The total number of purchased items of loyal customers is 56.360
- Total number of purchases with a discount of these customers is 54.236

Based on the testing of multiple algorithms, it has been concluded that it is necessary to segment these customers into certain categories in order to make it easier for them to commune and create precise and successful campaigns.

The used characteristics or variables in the cluster model are divided into two groups - basic characteristics and special characteristics. The basic characteristics are the number of purchases so far (the number of days in which it was purchased), the average amount on the account, the length of the loyalty card, the frequency of purchases (average number of purchases per year). The specific characteristics are Vitality (the probability that the customer is active, calculated on the basis of a special churn model), Expected average amount in the account in 2018 (calculated by a special model), Expected number of purchases in 2018 (calculated by a special model), Expected revenue in 2018 (calculated by a special model).

After determining the variables that were involved in modelling, a kMean cluster was applied and 8 clusters were obtained, of which 6 are significant for analysis. Clusters are named on the basis of the most important characteristics: Average, Seasonal, New, Churn, Shopaholic, Best customers, and in addition are Inactive and customers who are less than 15 days active, shown on figure 1:
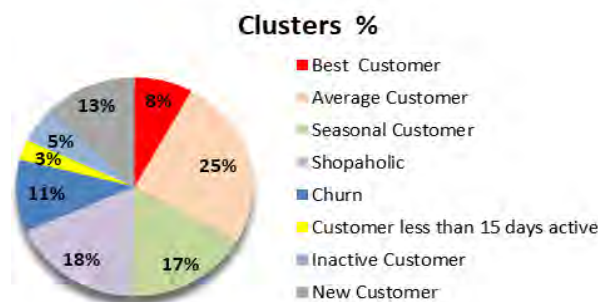
Figure 1: Percentage of clusters

Cluster 1 – Average

This cluster is characterized by buying cheap items and buying mostly women's things, such as hollyhocks and women's jeans. Shoes buy significantly less than average. The number of loyal customers in the cluster is 127, the number of men is 42, and the number of women is 85. This is the most numerous clusters, which accounts for 15.5% of the total revenue of loyal customers. Customers of this cluster are more vital than average, and the length of possession of a loyalty card is also higher than the average of all loyal customers.

Cluster 2 – Shopaholic

This cluster is characterized by buying it often; however, the amount on the accounts is less than the average. The cluster is predominantly women who have been loyal to the program for a long time. There is little risk of leaving these customers. Concerning revenue share, 35% of total revenue comes from this cluster. Expected revenue is significantly higher than the average in 2018.

Cluster 3 – Seasonal

This cluster is characterized by buying an average of two times a year, in the summer and winter periods. Customers are at a low risk of becoming inactive (churn), most often buying jackets, caps and equipment for the sea, however the revenue predicted in 2018 is small.

Cluster 4 – New

This cluster is characterized by buying up to half a year in a loyalty program. Mostly women make this cluster that buys most common earrings, bags, chains. This cluster is at a low risk of churn. This cluster predicts significantly higher revenue than average.

Cluster 5 – Churn

This cluster characterizes to buy shoes much more than other clusters. The likelihood that customers become inactive (churn) is as big as 50%. These are generally good buyers who have a slight downward trend in purchasing.

Saving a loyal customer is 10 times cheaper than gaining a new loyalty, it was necessary to pay extra attention to this cluster. It is divided into two groups, weaker outgoing customers and better outgoing customers. The properties that were used for additional clustering are vitality and expected revenue in 2018. The goal was to anticipate which customers are leaving and what the revenue from each customer is in 2018. The calculator has shown that if the departing loyal customers retain and thereby cross into the nearest clusters, they predict the income from 7.500 €.

Cluster 6 – Best

This cluster is characterized by the purchase of extremely often and extremely expensive items. The account amounts for these customers are extremely high. They are naturally characteristic. They are expected to earn 3 times the average. About 34% of total income comes from the best buyers, shown on table 1 and figure 2. More often, they buy steaming items than individual goods.

Table1. Share in total profit for loyalty customers
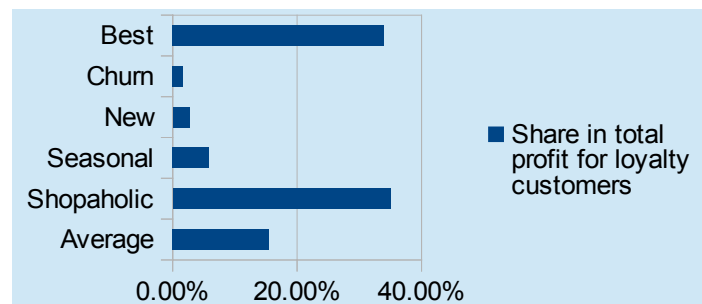
Figure 2: Share in total profit for loyalty customer

Conclusion

Clusters serve to make it easier to do upselling and cross selling. Similarities and differences are observed, as well as the hierarchy of clusters and activities are undertaken in the direction of migration of customers from the cluster to the cluster, in order to increase profitability and to influence the change in the behaviour of the consumer-participants.

Suggestion:

Average   ⟶   Shopaholic (increase number of purchases)
Shopaholic   ⟶   The Best (increase amounts on the account)
Seasonal   ⟶   The Best (increase number of purchases and amount on the account)
New   ⟶   Shopaholic (increase number of purchases)
Churn   ⟶   Seasonal (increase number of purchases in the season)

Cluster hierarchy has made the following recommendations:
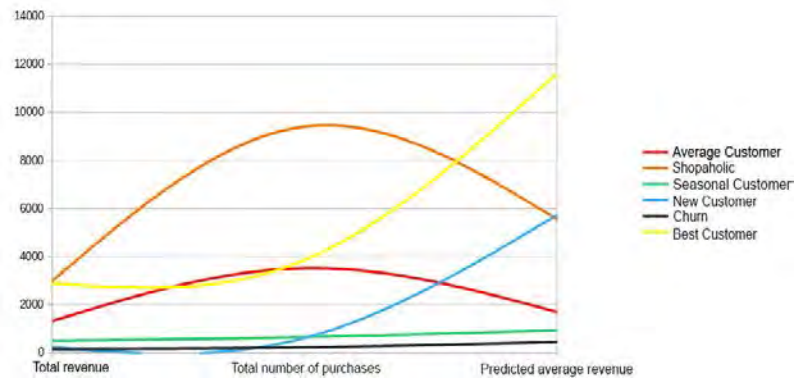
Figure 3: Cluster hierarchy

The figure 3. shows which cluster comes from and in which direction it works best in order to show the results first. The new buyers become Shopaholic when increasing the number of purchases, and on the other hand, seasonal buyers become an increase in the number of purchases by the average buyers. The average increase in the number of purchases is becoming a buyer for everyone. Shoppers, when buying expensive items, become the best buyers. Outgoing customers in a better group need to be kept in order to make them the Best Buyers.

In general, clustering as a technique of machine learning is extremely useful in high positioned decision making, and this technique is basically modelling sales - missed, linked, personalized, targeted. Intelligently programmed groups are useful for BI analysis due to accurate customer comparison; Groups are useful and necessary when designing group sales campaigns; groups introduce the company into a new level of business and build the level of personalization of customers; The groups give the possibility of alarm or easier detection when it becomes inactive (churn), who changes behaviour and how. Statistical modelling in company management processes and decisions in these companies is a sufficient and necessary condition for a sustainable and successful business.

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Zapošljivost i kompetencije studenata inženjerskog menadžmenta – očekivanja studenata Fakulteta za inženjerski menadžment

Tatjana Ilić-Kosanović[1]

[1] Univerzitet „Union-Nikola Tesla", Fakultet za inženjerski menadžment, Bulevar vojvode Mišića 43, tatjana.ikosanovic@fim.rs

Apstrakt: Inženjerski menadžment se često definiše kao specifična vrsta menadžmenta koja je potrebna za uspešno vođenje inženjerskog ili tehničkog osoblja i projekata. Inženjerski menadžment kao visokoškolski studijski program je nov u srpskim visokoškolskim ustanovama. Ovaj rad proučava zapošljivost studenata inženjerskog menadžmenta putem analize postojeće literature, a putem empirijskog istraživanja proučava očekivanja studenata od visokoškolskih centara za razvoj karijere vezano za svoju zapošljivost na tržištu rada, odnosno da li studenti menjaju svoja očekivanja pre i posle programa koji osnažuju upravljanje karijerom studenata kroz visokoškolske centre za razvoj karijere i dodatne kurseve na primeru studenata Fakulteta za inženjerski menadžment u Beogradu. Zaključuje se da visokoškolski centri za razvoj karijere predstavljaju ključ u asistenciji studentima u razvoju tzv. prenosivih veština, ali da su potrebna dalja istraživanja u cilju procene na koji način zapošljivost studenata inženjerskog menadžmenta može da se poveća kroz različite programe usmerene ka poboljšanju prenosivih veština.

Ključne reči: inženjerski menadžment, zapošljivost, studenti, kompetencije.

Employability and Competencies of the Engineering Management Students – Expectations of School of Engineering Management Students

Abstract: Engineering management is frequently defined as a specific type of management that is implemented for successful leading of engineering or technical personnel and projects. Engineering management as a higher education study program is new to Serbian higher educational institutions. The aim of this study is to evaluate employability of engineering management students and to, through empirical research, answer the question whether the students' change their expectations career development centers and their employability at the job market before and after receiving soft skills development trainings on the example of the students of School of Engineering Management from Belgrade, Serbia. It is concluded that the key in assisting the students in acquiring those skills are the programs and courses provided by higher education career development centers, but that the further study is necessary in order to assess the ways in which employability of the engineering management students can be increased through various programs aimed for improving their transferrable skills.

Key words: Engineering management, the students, employability, competencies.

1. Introduction

Engineering management is frequently defined as a specific type of management that is needed for successful leading of engineering or technical personnel and projects. Engineering management as a concept is a novelty in Serbia and exists for ten years, even though it is introduced in the US in 1950's and its roots can be traced back to the beginning of 20th century. Engineering management as a higher education study program is also new to Serbian higher educational institutions, the programs are prone

to changes and adaptation, and the students, prospective students, and general public are not yet aware of the usefulness of the knowledge and skills acquired. Furthermore, many employers aren't yet responsive to the advantages of the program and the broad range of knowledge that the engineering management students acquire during their undergraduate and graduate studies that can be applied in various work situations and settings.

Competencies are often defined as evident and measurable behaviors of a person needed for completion of a job task and include knowledge, skills, abilities and behaviors and can be grouped in general competencies (reading, writing) and technical competencies (Dessler, 2013). Transferable skills are the ones that can be applied in different work (and life) situations and environments and are essential for employability in the 21st century (Pellegrino, Hilton, 2012). Some of the most important transferrable skills are communication, interpersonal skills, teamwork, flexibility, achievement orientation, time management, judgment, decision making, analytical and problem solving skills.

The aim of this study is to evaluate employability of engineering management students and to, through empirical research, view the students' expectations of higher education career development centers regarding their employability before and after receiving development training through *Career Management* course provided by career development centers on the example of the students of School of Engineering Management from Belgrade, Serbia.

2. Employability and Competencies of Engineering Management Students – Literature Review

In today's economy, based on knowledge and susceptible to fast changes and increasing influence of technology, some of the greatest assets of the job seekers, both in engineering and management fields, are their flexibility, adaptability and willingness for continual development and learning. Strong professional knowledge (statistical and mathematical methods and models) and "hard" skills (data collection and interpretation) are necessary, but not enough, and the job seekers, especially recent graduates, are often confused on employers' expectations. Engineering managers, too, need to acquire knowledge, skills, abilities, and experience in management and engineering disciplines, but also to take a step further, to develop necessary skills in motivating, mentoring, and training of employees, especially in technical field. Their main task is often to act as an internal consultant for all departments in an organization in order to manage change, i.e. to develop, apply, and monitor new, more efficient and effective business processes and strategies. They are often required to generate new ideas, identify problems, and to find solutions in short period of time (Lawson & Price, 2003, p. 3).

Some of the main skills increasing the employability of engineers, managers, and, especially, engineering managers, are innovative problem solving, adaptation to change, knowledge management, and decision making, but also "soft" skills like willingness to learn, costumer orientation, leadership skills, interpersonal communication and cooperation, and guiding team towards a mutual goal (Desouza & Youkika, 2005; Fritts, 1998; Davenport & Prusak, 2000; Badaracco, 2002; Wenger, McDermott & Snyde, 2002; Montgomery, Lipshitz & Bremmer, 2005; Lima, Mesquita, Rocha, Rabelo, 2017). Also, the emphasis is often given on building the culture that supports development of employees (Badaracco, 2002). Some authors have also stated out motivation of the employees to develop empathy and trust (Goleman, 2004; Johnson & Eaton, 2002). Platts and Tomasevic (2006) went further and developed a model and a framework for developing trust as a professional competence, based on leadership studies at the Institute for Manufacturing at the University of Cambridge and the needs of construction projects.

Assessing the abovementioned skills, it is clear that the focus of higher education institutions' career development centers and programs should be given on so called transferrable skills, the skills that are required for engineering managers, engineers, and managers, but other professionals too, at various job positions, projects, tasks, and even careers (Abdulwahed & Hasna, 2017). Many of the world's most recognized faculties and universities have realized that it is necessary to develop these skills among the students from the beginning of the studies either through teaching (project based learning, participation in case studies, presentations, etc.) or through extracurricular activities (volunteering, debates, etc.) (Niles & Harris-Bowlsbey, 2009; Swanson & Fuad, 2010). Important insights on transferrable skills importance started to emerge with the research carried out during the 1980's and 1990's proved that higher education career development courses made it easier for the engineering and natural science

students to plan career after college and the students from the experimental group showed a higher degree of decision-making skills related to a career, better understanding of own interests, values, and knowledge, and were able to search for job related information and to acquire desired jobs more easily (Hughes & Karp, 2004).

As many higher education engineering management and industrial engineering institutions struggle to include "soft" competencies of the students to curricula (Lima, Mesquita, Rocha, Rabelo, 2017), many of them see an important role of the higher education career development centers and services that assist the students in career management in order to improve their employability and offer courses aimed at improving of transferrable skills (Niles & Harris Bowlsbey, 2009; Amundson, Harris Bowlsbey & Niles). Some centers also create specific programs for the development of the best students with the capacity to be successful engineers and managers, which can be implemented for engineering managers, too. Niles and Harris Bowlsbey (2009) state that career development center in higher education institution during the last thirty years are becoming crucial element of a higher education institution's ability to prepare the students for the fast moving job market needs. This is becoming even more important for developing countries such as Serbia, which must take significant steps towards a knowledge-based economy that can find its place in a global and changing marketplace and requires managers, project and team leaders who will be the driving force of projects aimed at the development of the economy. Career development centers at higher education institutions started to be more present and more organized in state and private universities, faculties and colleges from 2006 onward, but still don't have wide developed and accepted strategies on increasing of the students' employability (Ilić-Kosanović, 2014).

3. The Scope of Study and Data Collection

Career Development Center was introduced at the School of Engineering Management from its inception in 2010 and started to implement its programs in 2012 in order to assist the students in acquiring career management and employability skills. After researching career development theory and the best practice at the higher education institutions in USA and Great Britain, among other programs the compulsory fifteen week course aimed at improving students' transferrable skills, with the emphasis on "soft" skills (communication, presentation, teamwork, etc.) was developed for the first year students in order to improve engineering management students' employability. Thus, from the school year 2012/13 *Career Management Course* was introduced and in that particular year, the students from first to third year participated in the course.

The goal of the study was to analyze the difference in the students' expectations of the Career Development Center regarding their employability before - October 2012 (T1) and after - February 2013 (T2) attending the course *Career Management* that was developed in order to enhance the students' career management and employability skills through soft skills building (presentation, team work, communications, achievement orientation, analytical and problem solving skills). Anonymous survey was created that the students from I to III year could fill it out at the Library. Total participation was 69 respondents (N=69) which comprised 82.1% of the total sample.

4. Analysis and Interpretation on Engineering Management Students' Employability Expectations

In the employment expectations segment of the survey, key statements were:

1. I expect to be employed within one year after graduation.
2. I expect to find a job with a "good" compensation package after graduation.
3. I expect to find a job after graduation which provides various additional training programs.
4. I expect to find a job abroad after graduation.
5. I expect to develop my own business after graduation.

The five point Likert scale was used for assessing the statements (1 – I disagree completely; 2 – I disagree; 3 – I am neutral; 4 – I agree; 5 – I agree completely).

The following main research hypothesis (H_1) stated: There is statistically significant difference between the students' expectations regarding their employability expressed before and after attending the

Career Management course. Null hypothesis (H_0) stated: There is no statistically significant difference between the students' expectations regarding their employability expressed before and after attending the course. Research hypothesis was further divided into sub-hypotheses:

H_{1a}: The students expect to be employed within one year after graduation.
H_{1b}: The students expect to find a job with a "good" compensation package after graduation.
H_{1c}: The students expect to find a job after graduation which provides various additional training programs.
H_{1d}: The students expect to find job abroad after graduation.
H_{1e}: The students expect to develop their own business after graduation.

For formal hypotheses testing, *Student's t test* for Equality of Means was used to test the students' expectations regarding their employability before and after attending the *Career Management* course. Significance level (α) is .05. SPSS v 18 statistical package was applied.

Table 1 shows the basic statistical indicators of the students' *expectations of employment within one year after graduation*. In this case, expectations of the students before attending *Career Management* course (average response 4.16) are somewhat higher than expectations after attending a course (average response 3.97). *Student's t test* value is t = 1.121, which is below the critical test value of 1.666 (with the significance level p = 0.266>0.05). On the other hand, there is a negative correlation of the students' responses before and after attending the course (r = -0.137). Thus, in this case, we claim that there is no statistically significant difference (decrease) in the students' *expectations of employment within one year after graduation.* This, therefore, means that the H_{1a} hypothesis is not formally confirmed.

Table 1: *Student's t test* for Equality of Means of *the students' expectations of employment within one year after graduation*

									95% Confidence Interval of the Difference	
	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	P	r	Lower	Upper
T1	4.16	1.052	0.127	69	0.19	1.121	0.266	-0.137	-0.147	0.524
T2	3.97	0.785	0.095	69						

Table 2 shows the basic statistical indicators of the students' expectations *that after graduation they'll find a job with "good" compensation package*. In this case, expectations of the students before attending *Career Management* course (average response 4.35) are somewhat higher than the expectations after attending a course (average response 3.97). The value of *Student's test* statistics here is t = 2.578, i.e. it "exceeds" the critical value of the test 1.666 (with the significance level p = 0.012 <0.05). The negative correlation of the students' responses to this expectation before and after attending the course is r = -0.147. So, in this case, we claim that there is statistically significant difference (decrease) in the students' expectations *that after graduation they'll find a job with "good" compensation package*. This, therefore, means that H_{1b} hypothesis is formally confirmed.

Table 2: *Student's t test* for Equality of Means of *the students' expectations that after graduation they'll find a job with "good" compensation package*

									95% Confidence Interval of the Difference	
	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	P	r	Lower	Upper
T1	4.35	0.724	0.087	69	0.38	2.578	0.012	-0.147	0.085	0.668
T2	3.97	0.874	0.105	69						

Table 3 shows basic statistical indicators that relate, first of all, to the average values of the students' expectations *to find a job after graduation which enables various additional training programs*. Before attending the *Career Management* course, students' expectations were significantly less expressed (the

average value of their answers was only 2.57), and then increased to as much as 3.78. Therefore, there is a pronounced tendency of increase of this type of students' expectations, which was statistically confirmed. Namely, the relatively low value of the test-statistics t = -6.815 (with the significance level p = 0.000), confirms that there is a statistically significant difference, as well as a increase in the students' expectations before and after attending the *Career Management* course. Finally, the positive value of Pearson's linear correlation coefficient (r = 0.164) points to the fact that there is a positive but poor correlation between the respondents' answers before and after the survey. In this way, the hypothesis H_{1c} is formally proved.

Table 3: *Student's t test* for Equality of Means of *the students' expectations to find a job after graduation which enables various additional training programs*

	t test for Equality of Means									
	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	p	r	95% Confidence Interval of the Difference	
									Lower	Upper
T1	2.57	0.334	0.161	69	-1.21	-6.815	0.000	0.164	-1.574	-0.861
T2	3.78	0.905	0.109	69						

Table 4 gives basic statistical indicators of the students' expectations *that after graduation they'll find job opportunities abroad*. Here, expectations of the students before attending the *Career Management* course were strongly expressed (the average of their answers is 4.01), so that after attending the course they fell to 3.54. Nevertheless, the tendency of reducing this type of expectations is also statistically significant, as evidenced by the relatively high value of the corresponding test-statistics t = 2.647 (the significance level is p = 0.010). Therefore, it has been formally confirmed that there is a statistically significant difference, as well as a decrease in the students' expectations *that after graduation they'll find job opportunities abroad*, before and after attending the *Career Management* course. Note that there is a negative but somewhat more pronounced linear correlation of the students' responses (Pearson's Correlation Coefficient is r = -0.215). Consequently, in this case H_{1d} hypothesis is confirmed.

Table 4: *Student's t test* for Equality of Means of *the students' expectations that after graduation they'll find job opportunities abroad*

	t test for Equality of Means									
	Mean	Std. Deviation	Std. Error Mean	N	Mean Diff.	t	P	r	95% Confidence Interval of the Difference	
									Lower	Upper
T1	4.01	0.978	0.118	69	0.47	2.647	0.010	-0.215	0.118	0.839
T2	3.54	0.948	0.114	69						

Table 5 shows the basic statistical indicators that relate, first of all, to the average values of the students expecting *to develop their own business after graduation*. Before attending *Career Management* course, the students' expectations were considerably less expressed (the average value of their answers was only 2.45), and then increased to as much as 3.41. Therefore, there is a pronounced tendency of growth of this type of expectations, which is statistically confirmed. Namely, the relatively low value of the t-test statistics = -5.299 (with the significance level p = 0.000), confirms the conclusion that there is a statistically significant difference, but also an increase in the students' expectations before and after attending the *Career Management* course. Finally, the positive value of Pearson's coefficient (r = 0.176) points to the fact that between the answers of the surveyed students before and after the survey there is a positive but poor correlation. In this way, the hypothesis H_{1e} is formally proved.

Table 5. *Student's t test* for Equality of Means of students' expectations *to develop their own business after graduation*

| | Group Statistics | | | | t test for Equality of Means | | | | | |
| | Mean | Std. Deviation | Std. Error Mean | N | Mean Diff. | t | P | r | 95% Confidence Interval of the Difference | |
									Lower	Upper
T1	2.45	1.323	0.159	69	-0.96	-5.299	0.000	0.176	-1.317	0.596
T2	3.41	0.975	0.117	69						

Empirical research of the above mentioned main hypothesis and sub-hypotheses can provide the conclusions on students expectations regarding their employability expressed before and after attending the *Career Management* course. Regarding H_{1a} hypothesis, there is no statistically significant difference (decrease) in the students' expectations of employment within one year after graduation. The students still believed that the combination of their knowledge, skills and abilities would enable starting successful career after graduation. Regarding H_{1b} hypothesis, that the students expect to find a job with "good" compensation package after graduation, there is a statistically significant difference (decrease) in the students' expectations and the students in additional remarks stated that they were more aware of the other aspects important in a first job, mainly challenging tasks, and, especially, training and development opportunities.

Regarding H_{1c} hypothesis that the students expect to find a job after graduation which provides various additional training programs, there is a statistically significant difference, as well as an increase in the students' expectations before and after attending the *Career Management* course, and the hypothesis H_{1c} is formally proved. Regarding H_{1d} hypothesis on the students' expectations that after graduation they'll find job opportunities abroad, it has been formally confirmed that there is a statistically significant difference, as well as a decrease in the students' expectations and in this case H_{1d} hypothesis is confirmed. Regarding H_{1e} hypothesis that the students expect to develop their own business after graduation is formally proved.

5. Conclusion

Engineering management, which is defined as a specific type of management that needed for successful leading of engineering or technical personnel and projects, presents novelty in Serbia's higher education and business environment. Engineering management as a higher education study program is new to Serbian higher educational institutions, and the programs are prone to changes and adaptations for the students, prospective students, and general public to understand its advantages better. What is the most important, even the employers are not aware of the advantages of the program and the broad range of knowledge that the engineering management students acquire during their undergraduate and graduate studies that are applied in various work situations and settings.

Engineering management students, besides professional knowledge need to acquire so called transferable skills, the ones that can be applied in different work (and life) situations and environments and are essential for employability in the 21st century. The key in assisting the students in acquiring those skills are the programs and courses provided by higher education career development centers. In the empirical research, main research hypothesis (H_1), that there is statistically significant difference between the students' expectations regarding their employability expressed before and after attending the *Career Management* course, was proven.

Further study is necessary to assess the ways in which employability of the engineering management students can be increased through various programs aimed for improving their transferrable skills trough career development centers or through other formal and informal programs at higher education institutions with engineering management and industrial engineering study programs.

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Modeliranje poslovnih rizika, analiza slučaja: „Jasmin d.o.o"

Ognjen M. Raketić[1], Irena M. Rašević[2]

[1]INAT Summit, ognjen.raketic@gmail.com
[2]Fakultet tehničkih nauka Čačak, irenarasevic@yahoo.com

Apstrakt: Rad ima za cilj da objasni analizu rizika poslovanja trgovinskog preduzeća „Jasmin d.o.o." uz pomoć leveridž metode. Takođe, rad ukazuje na značaj leveridž metode u otkrivanju i otklanjanju rizika u poslovanju preduzeća. Osim toga, rad daje uvid u poslovanje trgovinskog preduzeća „Jasmin d.o.o" tokom 2016. godine. Nakon uvodnog poglavlja u kom je objašnjen pojam i vrste leveridža, rad se fokusira na istraživanje sve tri vrste leveridža. Na kraju rada se nalaze zaključna razmatranja i literatura koja je korišćena u ovom radu. U radu su korišćeni relevatni podaci koji se nalaze na sajtu agencije za privredne registre. Svrha i značaj ovog rada jeste u prikazivanju bitnosti leveridž metode u analizi rizika poslovanja preduzeća. Takođe, cilj ovog rada jeste da se podigne svest o validnosti leveridž metode u analizi rizika poslovanja preduzeća, usled nedovoljne zastupljenosti u Srbiji. Ovaj rad je upotrebljiv finansijskim analitičarima, kao i stručnjacima koji se bave analizom rizika poslovanja, ali ovaj rad mogu koristiti i studenti koji žele da se usavšavaju u oblasti poslovnih finansija.

Ključne reči: leveridž, rizik, troškovi, poslovanje, dobit.

Engineering Risk Analysis, Case Study of "Jasmin d.o.o."

Abstract: The paper aims to explain the risk analysis of the "Jasmin d.o.o." company using the leverage method. Also, the paper points to the importance of the leverage method in detecting and eliminating risks in the company's business. In addition, the paper gives insight into the operations of the "Jasmin d.o.o." company during 2016. After the introductory chapter in which the term and types of leverage are explained, the work focuses on the research of all three types of leverage. At the end of the paper, the final premises and literature used in this paper are found. The relevant data are available on the website of the Business Registers Agency. The purpose and significance of this paper is to present the essence of the leverage method in the analysis of business risk. Also, the aim of this paper is to raise awareness of the validity of the leverage method in the analysis of business risk, due to insufficient representation in Serbia. This paper is used by financial analysts as well as by experts who deal with business risk analysis, but students who want to study in the field of business finance can also use this work.

Keywords: leverage, risk, costs, business, profit.

1. Leverage business analysis

The concept of risk refers to less or more uncertainty about the expected outcome of the business activities of the company. However, two basic types of risks should be distinguished (G. Knežević, 2009):

- Business risk is related to the activity of the company, and it determines the uncertainties related to the expected business profit. The key of this risk is fixed costs that remain rigid (inelastic) to short-term oscillations in the scope of business activity.
- Financial risk is related to the business of a company where potential cash losses can arise, which directly affect the uncertainty of the future net profit. The key of this risk consists of fixed costs of financing that can not be adjusted to short-term oscillations of business profits.

An enterprise that engages both types of fixed costs (business and financial) is exposed to double risk - business and financial, where their combined operation is called a combined risk. The exposure of the

company to these risks presupposes the existence of an adequate method for measuring and quantifying risk. One of these methods is leverage. Using the leverage method, they try to evaluate the effects of business in the presence of the so-called constant factors (fixed costs – expenditures). Analogously to the above, one can speak of the following: business, financial and combined leverage.

- Business leverage is measured by business risk factors that show changes in business profits in relation to changes in sales revenue, in the sense of the following: any increase in sales volumes causes an even greater increase in profits. In addition, this is true and vice versa.
- Financial leverage - measured by financial risk factors that show changes in net profit in relation to business profit, in the sense of the following: any increase in business profits causes an even higher increase in net profit. In addition, this is true and vice versa.
- Combined Leverage - measured by the combined leverage factor that shows the effect of total risk (business and financial), in the sense of the following: any increase in sales volume directly affects the increase in net profit and return on own funds. In addition, this is true and vice versa.

1.1. Business leverage

Business leverage reflects the degree of uncertainty associated with achieving business gains as a return on total business assets. (Terzić and Milojević, 2013).

- The essence of the business leverage is reflected in the following: if the enterprise has more fixed costs then it is more at risk of failing to cover sales in the event of a fall in sales and fixed costs, or there is a risk that the company will operate with a loss.
- Business leverage is measured and reported through a business risk factor (leverage), which shows changes in business profits in relation to changes in income from realization. The business leverage factor can be calculated using the following simple formula:

$$\text{Factor of business leverage} = \frac{\% \ (percentage) \ of \ business \ profit \ change}{\% \ (percentage) \ of \ change \ in \ sales \ volume}$$

This factor shows that changing the volume of sales for a certain percentage amount affects the percentage change in business profits.

Table 1: Business leverage of the trading company "Jasmin d.o.o" Belgrade.

S.n	Position name	Initial state (in RSD)	Increase in sales volume by 10% (in RSD)	Decrease in sales volume by 10% (in RSD)
1.	Sales revenue (in thousands)	1.584.813	1.743.294	1.426.331
2.	Variable costs (in thousands)	1.282.648	1.410.913	1.154.383
3.	Marginal gain (1 - 2)	302.165	332.381	271.948
4.	Fixed costs	138.130	138.130	138.130
5.	Business Profit (3 - 4)	164.035	194.251	133.818
	Factor of business leverage FBL = MG / FC	2.2	2.4	2

Source: ABR

Business leverage factor is 2.2, which means an increase (to decrease the) sales volume (in %) leading to a double increase (decrease) in operating profit margin (in %).

Increasing the volume of sales of about 10% (from 1,584,813 to 1,734,294 rsd) leads to an increase of business profit by 24% (from 164 035 to 194 251 RSD).

Reduced volume by 10% (from 1,584,813 to 1,426,331 rsd) leads to a reduction of business profit by 20% (from 164 035 to 133 818 rsd).

The explanation of this fact leverage factors of the business is in the fixed costs are costs weight ,, solid "(elastic) to change the volume of business activities of the company.

Based on the so far mentioned, leads to the conclusion that the financial structure of the company directly determined by the intensity of effects of business leverage. Specifically, high leverage factor of business indicates a situation in which major fluctuations in business profit can be achieved on the basis of relatively small changes in the volume of sales, which also represents a proportionally high level of business risk. In such conditions, the financing of debt becomes very risky and that at least two reasons: (1) due to greater distrust of creditors in the earning power of the company, and (2) due to the increased uncertainty that adverse fluctuations in operating results lead the company into a state of insolvency.

1.2. Financial leverage

Financial leverage reflects the degree of uncertainty related to the realization of net income as a return on net operating assets.

The essence of financial leverage lies in the following: if the debt capital increased if they are fixed expenses that it requires high, then there is a greater risk that their regular company operations will not be able to cover fixed expenses and financing. Analogously, the size of financial risk (leverage) depends on the degree by which the fixed expenses for interest covered in the business of winning.

Financial leverage is measured through factors of financial risk (leverage) that shows the changes in net - profit in relation to changes in the business of winning. Business leverage factor can be calculated using the following simple formula:

$$\text{Financial leverage factor} = \frac{\%\,(percentage)\ increase\ in\ net\ yield}{\%\,(percentage)\ increase\ in\ business\ profit}$$

Table 2: Financial leverage of the trading company "Jasmin d.o.o"

S.n.	Position name	Initial state (in RSD)	Increase in business profit by 10% (RSD)	Decrease of business profit by 10% (in RSD)
1.	Business profit (in thousands)	109.305	120.236	98.375
2.	Interest (in thousands)	28.636	28.636	28.636
3.	Net profit (1 - 2) (in thousands)	80.669	91.600	69.739
4.	Return on total assets	11%	12%	10%
5.	Rate of return on own business assets	28%	32%	25%
	Factor of financial leverage: FFL = 1.35			

Source: ABR

Factor of financial leverage is 1.35, which means that an increase (decrease) in operating profit margin (in %) lead to a 1.35 times increase (decrease) in net - income (in %).

Increasing the business profit by 10% (from 109,305 to 120,236 RSD) results in an increase in net - the yield of 13.5% (80,669 to 91.600 RSD). Reduction of business profit by 10% (from 98,375 to 109,305 RSD) results in a decrease in net - the yield of 13.5% (from 80,669 to 69.739 RSD).

The explanation of this fact financial leverage factor is the presence of fixed financing expenses (interest on debt).

Table 3: Positive and negative effects of the financial leverage of the trading company "Jasmin doo"

Positive fact	Negative fact
The company is responsible for using borrowed sources of financing in cases where the interest paid on loans is lower (10%) than the rate of return on the total business assets of the enterprise (11%). The consequence of the positive effect of the financial leverage on the profitability of own capital (the so-called positive effects of financing), since the return on own business assets (32%) is higher than the rate of return on total business assets (12%).	The company is not entitled to use borrowed funds in cases where the interest paid on loans is equal (10%) to the rate of return on the total business assets of the enterprise (10%). The consequence of the negative effect of the financial leverage on the profitability of own capital (so-called negative effects of financing), although the return on own business assets (25%) is higher than the rate of return on total business assets (10%).

Source: ABR

1.3. Compound leverage

Compound leverage resulting from the fact business and financial leverage. Therefore, compound leverage represents the overall risk facing a company.

Effect of a complex leverage is expressed in terms of the corresponding coefficient or factor, which is called the factor of the combined or composite of leverage, and which is equal to the product by a business leverage and financial leverage, which is expressed by the following formula:

Factor of compound leverage = Factor of Business leverage * Factor of Financial Leverage.

Factor complex leverage reflects the enterprise's overall (total) risk, with considering that the realization of future net income and return on net assets brought into direct interdependence with possible changes in the scope sales changes in sales revenue.

Table 4: Compound leverage of the trading company "Jasmin doo"

S.n	Position name	Initial state (in RSD)	Increase in sales volume by 10% (in RSD)	Decrease in sales volume by 10% (in RSD)
1.	Sales revenue (in thousands)	1.584.813	1.743.294	1.426.332
2.	Variable costs (in thousands)	1.282.648	1.410.913	1.154.383
3.	Marginal gain (1 - 2) (in thousands)	302.165	332.381	271.949
4.	Fixed costs (In thousands)	138.130	138.130	138.130
5.	Business Profit (3 - 4) (in thousands)	164.035	194.251	133.819
6.	Interest (In thousands)	28.636	28.636	28.636
7.	Net Profit (5 – 6) (in thousands)	135.399	165.615	105.183
8.	Rate of return on own funds	40%	48%	31%
9.	% increase (decrease) net profit and return on own funds		22.3%	(22.3%)

Source: ABR

Based on the data from the table and the results of the combined factor (composite) is 1.8 leverage.

The percentage increase in sales volume caused 1.8-fold increase in net profit and the rate of return on net assets.

The percentage decrease in sales volume caused 1.8 times reduction of net profit and the rate of return on net assets.

When it comes to increasing sales volume by 10% (from 1,584,813 to 1,743,294 RSD) this has the effect of increasing net income by 22.3% (from 135,399 to 165,615 RSD). At the same time, the rate of return on equity increased from 40% to 48%.

When it comes to reducing the volume of sales by 10% (from 1,584,813 to 1,426,332 RSD) this has the effect of reducing net income by 22.3% (from 135,399 to 105,183 RSD). At the same time, the rate of return on net assets decreased from 40% to 31%.

2. Conclusion

Based on the analysis of business leverage, the conclusion is that the financial structure of the company directly determined by the intensity of effects of business leverage. High leverage factor of business indicates a situation in which major fluctuations in business profit can be achieved on the basis of relatively small changes in the volume of sales, which also represents a reasonably high degree of business risk (operating leverage companies' Jasmin doo "is 2.2).

In such conditions, the financing of debt becomes very risky for two reasons:

1. Because of the growing distrust of creditors in the earning power of the company, and
2. Because of the increased uncertainty that the adverse fluctuations business results lead the company into a state of insolvency.

The interest of the company "Jasmin doo" is the factor of financial risk as low as possible, ie, company must constantly encourages all factors that act to reduce financial risk and at the same time suppress all factors that increase it, to financial leverage factor was as low as possible, and weighed unit (financial leverage factor in the company "Jasmin doo" is 1.35).

The company "Jasmin d.o.o." has a low factor of a complex leverage (1.8) which means that the property is moved to the supra-tumbler assets, and the depreciation expense and lower. Company "Jasmin doo" can afford large expenditures for financing, capital structure moving toward the capital borrowed, and then the company will have an acceptable factor of business leverage.

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Finansijski inženjering u Sloveniji: juče, danas, sutra
Malči Grivec[1]

[1] Faculty of Business, Management and Informatics, Novo mesto, malci.grivec@guest.arnes.si

Apstrakt: Osnova dobrih poslovnih odluka su kvalitetne informacije, gde važnu ulogu imaju računovodstvene informacije. One su važne i za interne i za eksterne korisnike. Ako se istorijski najpre razvilo računovodstvo za svrhe eksternog izveštavanja, danas ne možemo da zamislimo donošenje poslovnih odluka bez poslovodnog računovodstva. Sve češće smo svesni da računovodstvo ima važan uticaj na društvo kao celinu i kao takvo moramo i da ga tretiramo. Zato ne iznenađuje, što države i interesna udruženja mnogo pažnje posvećuju pravnom uređivanju te oblasti. Uz to oni sve veći akcenat stavljaju i na etičko regulisanje te oblasti.

U prilogu prikazujemo razvoj računovodstva kroz vreme u Sloveniji, koja je vrlo rano počela biti svesna značaja računovodstva za dobro upravljanje preduzećima. Sa privrednim razvojem i sve većom konkurentnošću okruženja zahtevi u pogledu kvalitetnih informacija su sve više rasli, a time se povećavala potreba za obrazovanim računovođom, koji samostalno i nezavisno priprema (računovodstvene) informacije i istovremeno time menadžmentu pomaže da donosi dobre (održive) poslovne odluke. Temelj svega toga je uređen pravni osnov, koji je takođe predstavljen u prilogu.

Ključne reči: računovodstvo, razvoj računovodstva, slovenački računovodstveni standardi, poslovne odluke, Slovenija

Financial Engineering in Slovenia:
Yesterday, Today, and Tomorrow

Abstract: The cornerstone of good business decisions is quality information, in which accounting information plays an important role. The latter is important for both internal and external users. While accounting was first developed for the purpose of external reporting, today we cannot imagine business decision-making without management accounting. However, we are increasingly aware that accounting has a significant impact on society as a whole, and we must also treat it as such. It is therefore not surprising that countries and interest groups pay much attention to the legal regulation of the field. In addition, ethical regulation of the field is becoming increasingly important as well.

The paper presents the development of the accounting profession in Slovenia through time, which was aware at a very early stage of the importance of accounting for the good governance of companies. With economic development and an increasingly competitive environment, the requirements continue to increase for quality information and also the need for educated accountants who independently prepare (accounting) information, while at the same time helping management to make good (sustainable) business decisions. The foundation for all this is the legal basis, which is also presented in the paper.

Key words: accounting, development of accounting, Slovenian Accounting Standards, business decisions, Slovenia.

1. Introduction

The accounting process is the collecting of data and forming of information, both expressed in the monetary unit of measure, about funds, liabilities to funds sources, revenues and expenses. It includes bookkeeping, accounting budgeting, accounting supervision and accounting analysis. Turk (2004) claims that it is necessary to differentiate it from the accounting system, which is the structure of accounting monitoring and auditing of funds, liabilities to funds sources, revenues and expenses, which consists of bookkeeping, the structure of accounting budgeting, accounting supervision and accounting analysis.

Accountancy as such is placed into information functions (Igličar, Hočevar and Zaman Groff, 2017) which become more important every day. In the same way accounting information and other information, which are published by companies within annual reports, gains on significance. Consecutively the role of the accountant in a company becomes more important every day, as he/she has the operational and financial review and so he/she can give advice to the company and helps to orientate it. Thus, Mayer (2011) even points out that one of the most important tasks of the accountant is the preparation of proposals for business decisions. Indeed, we cannot imagine a CEO who would take important business decisions without the involvement of an accountant. This was known very early, since the origins of the most significant function of accounting – the preparation of quality information for management – can already be traced to a book published in 1946 (Petkovič, 2012).

Now, accountants also face the great challenge of so-called social accounting, which requires of them to prepare social reports. The latter disclose the level of responsibility that the company shows towards stakeholders, in particular to the natural environment (Poročilo o delu Slovenskega inštituta za revizijo za leto 2006, 2007). Nonetheless, compared to the treatment of the effects of externalities on the development of accounting, the effect of accounting on the environment is in theory considerably less treated and unduly neglected. In fact, the impact of accounting information can be examined in at least two areas: (1) the impact on the quality of business decision-making, (2) the impact on forming business objectives from the point of view of the company's operations and from the point of view of society as a whole (Bergant, 2017). Therefore, day-to-day education within the profession as well as the acquisition of related knowledge is of key importance (Mayer, 2012). Due to the difficult economic situation, this will be even more important in the future.

2. Early beginnings of accountancy

Till 1945 we did not talk about accountancy at all but only about bookkeeping, where the most important were business books, where information was booked in and information was found. Not until cards which referred to separate accounts came into use, the expression/term accountancy appeared. Hereby the proper part of controlling bookkeeping documents and formal accuracy of business books was added to bookkeeping (Turk, 2007).

An important movement in the accounting process as an activity represents the Decree on uniforming accountancy, published on 1 February 1945, which presented five fundamental forms of accountancy: bookkeeping with a balance of accounts as well as a loss and profit account, current (trading) account, calculation, statistics with comparison and planning (Race, 1980). This was the first time that the accounting process did not only mean keeping accounts but being concerned about good husbandry with considering proper information (Turk, 2007). Race (1980) also says that by doing so some unity has been reached which enabled the comparison of data.

However, the Act of standard accountancy, passed on the 20 November 1946, listed within accountancy bookkeeping with a balance of accounts as well as loss and profit account, current (trading) account and calculation only. Let there also be said that it was necessary to keep operative and statistical evidence whereby the latter is understood as analysing. But there was not a trace about planning anymore. The service which started to work on drafting estimates and pre-calculations as well as the studying of operations for the internal needs of managing was reinstated only after 1952 (Turk, 2007).

Since 1961 we can talk about accountancy which is known today and includes all four elements – bookkeeping, budgeting, accounting supervision and accounting analysis. Nevertheless, legally there was only talk about bookkeeping and not accountancy from 1946 to 1989 when the Act on accountancy was passed in Yugoslavia and consequently in Slovenia, in the meantime the profession was fostering the idea of a total accounting process (Turk, 2007). This is also evidenced by the 1946 book entitled 'Equity Method Accounting – Principles and Commentary on Normal Account Schedules for Industry and Trade', in which the authors present the efforts of that time to ensure fair accounting and the comparability of accounting principles by unifying charts of accounts and professional rules (Petkovič, 2012).

Such were the beginnings of the so called Slovene accounting school. The way of professional development in the following years up to today is presented in continuation.

3. The development of modern accountancy in Slovenia

From the point of development of modern accountancy the year 1965 was a turning point undoubtedly. It was then when Ivan Turk and Janko Kralj with regard to foreign literature and national experiences defined accountancy in the way that is known today. Taking this into consideration Slavka Kavčič (1998) divided the development of accountancy since then up to today into five periods:

- the period of intensive presentation of theoretical findings in the field of accountancy and their practical use (1965-1973),
- the period of looking for solutions for implementation of socio-economic relations, which were brought by constitutional amendments from 1971 and the Act of associated labour (1973-1978),
- the period of forming the methodology for preparing accounting information on the basis of which the performance and efficiency of companies could be improved (1979-1987),
- the period of intensive preparation on the standardization of Slovene accounting solutions and the indepence of the Slovene accounting profession (1988-1993),
- the period after passing Slovene accounting standards (since 1994).

In continuation I only state key objects which contributed to the state of accountancy today. But they are by no means all events and findings which have proved to be more or less important through the separate periods.

3.1. The period from 1965-1973

In this period it was most important that cost accounting declared for the accountancy which includes the total internal operating in a working organization and besides bookkeeping also budgeting processes in the internal operating field, their supervision and analysis. Cost accounting should also be more directed to the needs of business decisions (Kavčič, 1998). In this way the idea of accounting being only bookkeeping came to an end.

They also emphasized the meaning of budgetary calculations and standard costs as well as the meaning of cost budgeting. The idea of sharing costs regarding different points of view appears as well, which is still important today, especially within management accounts. The idea of analysing discrepancies to individual partial discrepancies at costs was developed and the meaning of accounting information regarding business functions and place of responsibility was emphasized (Kavčič, 1998). We can say they are theoretical bases of management accounts which are known today.

It was then already that the proposal for separating accounting functions from financial functions was made, which has proven essential today despite various intermediate different attempts.

From this period the beginnings of the Code of accounting principles, the Code of business ethics of an accountant and the Regulations of accountancy, suggested by dr. Ivan Turk, originated. So the foundation for legal directions was laid, namely that accounting solutions should only be prepared by those qualified. At the same time accounting experts bound themselves to respect ethic rules. (Kavčič, 1998). Both codes were passed in 1972; first they were passed by the Association of economists of Slovenia and later at the conference of the Association of accounting and financial workers of the Socialistic Republic of Slovenia. The other republics in former Yugoslavia followed the example and so those two codes became general Yugoslavian codes which as the only ones to date caused international response (Turk, 2007); it is a fact that the codes were translated into several world languages, among others also Chinese.

So the Code of business ethics engaged accountants to write accounting reports which are accurate, proper and in due time. The reports should be a help for those they are written for.   Accountants should also consider internal and external regulations and improve them; they should play a role on uniforming reports for internal and external needs as well as on uniforming of drawing up estimates

and accounts. The code also required the care of qualitative work and professional further training (Turk, 2007).

Exactly those ethical dilemmas are more and more exposed today and not only in the field of accountancy. It is a fact that in the developed market economy there are a lot of offers of individual products and that it is necessary to make an effort for each individual consumer. However, the field of accounting information is a field that is regarding the financial consequences for a company itself as well as its business partners, especially sensitive from the ethic point of view. The latter has particularly become significant after respondent scandals in the USA (Enron). So the educational directions for accountants also pay attention to such knowledge.

3.2. The period from 1973-1978

In this period experts were looking for accounting solutions regarding the implementation of income relations in practice. In 1975 Ivan Turk prepared a contents model plan for dividing the company's property in its smaller component parts and an account model for the circulation of services and (semi-)products between these parts. Hereby solutions appeared which were already known abroad, namely transferable prices (Kavčič, 1998).

This was also the period when information became more and more important as it was necessary to find out the share of individual participants in a common income. The idea appeared that it is necessary to form an information system in a way that on its basis it would be possible to decide on planning, creating and supervising. In this same period also a practical case of using the computer for forming accounting information appeared. From this period, we have to mention undoubtedly the development of the system of reciprocal connected indicators. This is for the development of accountancy in Slovenia especially important as this is the result of national knowledge – the knowledge of Ivan Turk (Kavčič, 1998).

3.3. The period from 1979-1987

This period was marked by bad economic results and an increasing inflation. Therefore the Program of economic stabilization was passed. Not even the accounting profession which emphasized the significance of the search for the reasons of variances could pass by. For this purpose Ivan Turk presented the methodology of analysis of variances from the performed ones. From this period we also know the proposal that it is necessary to consider individual indexes of prices for the reassurance of real accounting statements in the circumstances of inflation. It is a revaluation proposal (Kavčič, 1998).

3.4. The period from 1988-1993

Till this period accounting solutions were directed to pure manufacturing companies. After this period more attention is paid to specialities of accountancy in special businesses such as banks, public companies and family companies. The need for adaptation of solutions appeared as Europe was getting nearer (Kavčič, 1998).

Consequently, the need for comparability of accounting statements with other countries appeared in Slovenia as well as in Yugoslavia. In this period the accounting profession realized that it is not possible to foresee all business events and all economic flows and situations, therefore the accounting profession had to look for solutions themselves (Kavčič, 1998). Consecutively the proposal appeared to prepare Yugoslavian accounting standards on the basis of the passed Code of accounting principles but the idea died away because of the circumstances in some countries at that time. However, the development in Slovenia went on as it was said by Koželj (1999) Slovenia needed the standards more than former Yugoslavia if they wanted to get into the world and cooperate economically with it.

At the same time the tendency appears to include foreign knowledge into Slovene solutions (theories, regulations, etc.). In connection with these discussions about the possibilities of using international accounting standards in Yugoslavia and so in Slovenia appear. In this period it was also found out that the Slovene solution is already ahead of solutions from other western countries as the Act of accountancy from 1989 already contained some solutions of the IV. directive of the European Community (Kavčič, 1998 and Turk, 2007). It was only that act that started talking about accountancy

and not only about bookkeeping as it was usual until then. According to Turk (2007) it is essential that the 5th article of this act gave the profession the right to arrange accounting questions. So the way to drawing up national accounting standards was open. The result of all that was that the board of the Association of accountants, financiers and auditors of Slovenia passed 32 Slovene accounting standards on 21 April 1993 which represented a new beginning in accountancy.

It certainly can be said that the year 1993 was a transitional year for Slovene companies from the old, by the Act of accountancy settled accounting system, to the new account system which is based on the Slovene Accounting Standards and as such defines the Companies Act. So the companies gained a more realistic value of means and sources of means in the balance sheet (Novak, 1994).

Slovene Accounting Standards are obligatory accounting standards which were passed by authority by the Slovene Institute of Auditors (Turk, 2004). They are founded on the Code of accounting principles and consider modern achievements in the world at the same time, especially International Accounting Standards or International Financial Reporting Standards. They include a rather broader professional field than IAS or IFRS as they are engaged in internal information and so in a rounded up whole represent everything that experts in organisations have to know (Turk, 2007). So it can be said that Slovene Accounting Standards are an original fusion of national accounting theory with international requirements. As such they are not only directed to external accounting reports about achievements in the past like International Accounting Standards. They proceed from the basic idea that external accounting reports, which are formed by external requirements, have to influence the fundamental regulation of the accounting process, which are special solutions at internal reports based on (Slovene Accounting Standards 2001).

3.5. The period from 1994-2015

This is in the first place a period when Slovenia intensely started to include into international economic flows. So the need for qualitative information and among them accounting information increased. So according to Kavčič (1998) methods for a (quick) preparation of accounting information on the basis of which decisions are made regarding production and sales are intensely being looked for.

Likewise in this same period special methods of calculating appeared for the first time (Kavčič, 1998):
- the method of activity based costing – ABC which devotes above all to general variable costs and looks for bases for their allocation to cost holders; and
- the method of target costing which is the proces of strategic profit achieving and cost controlling. The key questions here are what kind of characteristics the product must have and how much this product can cost (Turk, Kavčič & Kokotec-Novak, 2003).

But above all this is the period when Slovene companies started (1 January 1994) to use Slovene Accounting Standards. By passing Slovene Accounting Standards it was left to the profession to make decisions about all important questions connected with accountancy as all the other acts left managing these questions to Slovene Accounting Standards (SRS 2006, 2006).

After this year we witness a quick theoretical development in the world as well. It is right to say that the Slovene accounting theory is under a big influence of the Anglo-american accounting school (SRS 2006, 2006). Under this influence it has also come to big changes in internatioanl accounting standards. So the Slovene Institute of Auditors passed in 2001 the new Slovene Accounting Standards 2001 which were re-formed regarding the newer development in the world (Turk, 2007). These Slovene Accounting Standards were in a theoretical and realizable meaning revolutionary and required a change of manner of thinking, respectively they changed the basic way of dealing with and understanding the accounting process. These Slovene Accounting Standards originated from the modern way of valuation items in accounting statements which recommends and emphasizes above all a real and honest image of the balance of assets and liabilities to assets sources as well as real and honest business and financial results of the company (SRS 2016, 2016). Consequently, a bigger significance of respecting principles of honest valuation, above all, when showing assets and liabilities was emphasized (SRS 2006, 2006). For this purpose Slovene Accounting Standards abandoned the known system for accounting revalorization of assets and liabilites and replaced it by revaluation. At the same time the importance of accountants in a company increased (Odar, 2001). Likewise Slovene Accounting Standards proceeded from considering the assumption of caution when drawing up and finding business results as well as

from considering the assumption of the origin of a business event. Slovene Accounting Standards thus introduced into the Slovene environment of accounting processes the foundation for measuring items in accounting statements according to an honest value which was very important for public services (SRS 2006, 2006).

The next important step for Slovenia was the entry to the European Union on 1 May 2004. As a consequence the need for another change of some laws and the Slovene Accounting Standards appeared. From the point of significance for accountancy let me mention above all the Companies Act (ZGD-1) which is the basic act about the operating of companies and defines the legal outlines and bases of accounting processes of companies (SRS 2006, 2006).

This includes, inter alia, the method of accounting procedures used in operations monitoring and the method of valuation and measurement of individual categories, the compilation of statements of assets and liabilities, the determination of cash flows and companies' profit and loss statements (SRS 2016, 2016).

Another important and pretentious step in Slovenia was the transition to the Euro. Especially information systems needed to be adapted which without a close cooperation of IT specialists and accountants would have been impossible. One of the problems was the number of decimal places at prices as some prices were very small during the conversion and when rounding up to two decimal places (which was usual practice) it came to big variances (Ilovar, 2006). This was followed by a period of parallel entry of sums in SIT for the basics from 2006 and sums in Euros for basics since 1 January 2007. Regarding to the fact that there had been a test environment established before the introduction of the Euro, later there were no problems anymore.

3.6. The period from 2016 on

When the SAS were adopted in 2006, it was already known that these were not the latest amendments to the SAS. And these most certainly are not the last amendments to the rules or, therefore, the SAS. The fact is that accounting must adapt to the circumstances in the environment in which companies operate. Thus, in 2016, we started using the Slovenian Accounting Standards 2016 (SAS 2016). These standards are also based on the Companies Act (ZGD-1) and transpose the content of the new accounting Directive 2013/34/EU (Odar, in: SAS 2016, 2016), and a partial amendment to Directive 2006/43/EC (Mušič Bajuk, 2014). The Slovenian Companies Act (ZGD) also transposes into Slovenian law a partial implementation of the EU Directive on the Application of International Accounting Standards. According to this, certain companies stipulated by the legislation of a Member State must prepare consolidated financial statements in accordance with the International Financial Reporting Standards (IFRS) if their securities are traded in a regulated market of any Member State as of the balance sheet date. It is still the case that, according to the IFRS, financial statements in Slovenia are compiled by banks and insurance companies, as well as companies that are committed to consolidation. The commitment applies to compiling consolidated financial statements. In addition, Mušič Bajuk (2016a) adds that we must be aware that nothing additional can be prescribed by national legislation if companies that keep accounts on the basis of regulation compile their consolidated and individual financial statements just, and only, in accordance with the IFRS. However, domestic legislation may regulate things that are not defined, including, among other things, the compiling of a business report that all companies in Slovenia will have to compile in accordance with the Companies Act (ZGD-1). The provisions of the Companies Act represent the highest level, i.e. they supersede the SAS and IFRS. In this way, the legislator sought to prevent other institutions in Slovenia from arbitrarily interpreting or prescribing the processing of accounting information of business events without the cooperation of the accounting profession (Mušič Bajuk, 2014). With this, the legislator had in mind the harmonisation of interests between those drafting accounts and the users of financial statements (Marušič Bajuk, 2014).

Considering the foregoing, the SAS 2016 were created. Therefore, the SAS are the rules of the profession which further break down and elaborate the statutory basic rules and accounting requirements, and explain and stipulate how they are used (SAS 2016, 2016, page 7). Their purpose is to simplify accounting, in particular for micro- and small enterprises (Odar, 2015).

The SAS 2016 derive from the SAS 2006, but are supplemented with the latest theoretical advances in accounting. The SAS 2016 prescribes the new systematics, so that the application of accounting rules is clear, unambiguous and more user-friendly (Bajuk Mušič, 2016b).

The main difference between the new and old SAS lies in the fact that the SAS 2016, similar to IFRSs, discuss only the rules of financial accounting and reporting for the external needs of an organisation. The SAS 2016 govern the accounting rules for external financial reporting, primarily for companies. Of course, they will also be used by other organisations, such as sole proprietors, institutions, associations, agencies and even state organisations if this is specifically prescribed by sectoral provisions. According to the revised concept of accounting, the fundamental rules of accounting, in particular the rules of recognition, the elimination of recognition, measurement and valuation of economic categories are the same in all organisations, irrespective of the legal and status form of organisations. Thus, special standards only regulate the specifics of accounting solutions that refer to organisations that are not companies, i.e. they are social enterprises (Turk, in: SAS 2016, 2016).

A key novelty in the SAS 2016 is also that the SAS 2006 function as independent standards and no longer refer to the provisions of the IFRSs. The provisions of the IFRSs only serve as information on professional achievements (Turk, in: SAS 2016, 2016). In fact, in the introduction, the SAS even stipulate that organisations do not apply any provision of the IFRS directly, but only as an example of good business practice. At the same time, the Companies Act (ZGD-1) stipulates that the SAS should not be in conflict with the IFRS in their design. Nonetheless, differences between the SAS and IFRS exist, and will increase from year to year due to rapid changes in the IFRS (Bajuk Mušič, 2016a).

The SAS 2016 complements the Prudential Accounting Rules (PAR), the use of which is not mandatory, but recommended primarily for internal reporting. The PARs discuss the methodology of operations in individual spheres of accounting activities: i.e. financial budgeting, bookkeeping, accounting supervision, accounting analysis and providing accounting information, as well as consolidation. Most of these PARs were formally named as standard in the SAS 2006 (Turk, in: SAS 2016, 2016).

However good the regulation of the field, it does not lead to fair and high quality accounting information if the work is not carried out by suitably qualified persons. Although it is a very important function from the social perspective, anyone in Slovenia can practice the profession of an accountant (Kališnik, 2014, page 8), regardless of their education. In this way, the profession, which was supposed to be one of the guarantees of financial transparency in the operations of companies, organisations and public administrations, has been degraded. Namely, there is a noticeable lack of self-regulation to increase the quality of accounting services by eliminating unsuitable providers. The users of accounting information need quality information to make the right decisions. However, if the environment does not require the minimum competence of accountants, this involves a high risk for the quality of information (Štumberger, Slapničar &Zaman Groff, 2014).

Since members of the profession in Slovenia were aware of this problem, they wanted to improve the situation, and therefore in 2014 established the Committee for the Unification of the Accounting Group. The purpose of the unification of the accounting professional group is to (1) promote the professional competence of the professional group, (2) strengthen professional ethics in the profession, and (3) improve the image of the professional group (Prusnik, 2016). According to Mojca Kunšek, MA, director of the Agency for Public Legal Records and Related Services (AJPES), this will be reflected in a trusting relationship between accounting experts and clients and a fair presentation of business operations from both sides, respectively (Brezavšček, 2017b).

On the basis of the Committee's work, the Rules on the acquisition and maintenance of professional titles in the accounting professional group, which define professional titles (bookkeepers, certified bookkeepers, accountants, certified accountants and specialist certified accountants), their hierarchy and conditions for acquiring and maintaining titles were drafted (Prusnik, 207).

After two years, in 2017, a register of the accounting professional group was opened in which eligible individuals (formal education and/or work experience) can be registered. This should establish transparent criteria and conditions for performing the accounting profession in Slovenia. In this way, the Committee wants to develop harmonised qualification criteria and strengthen professional ethics at

the national level, and thereby increase the satisfaction of users of accounting services and information, as well as improve the conditions for work within the accounting group (Prusnik, 2017).

Moreover, there are other advantages. Thus, Jana Ahčin, the General Director of the Financial Administration of the Republic of Slovenia, believes that taxpayers will be able to verify in the public register of accountants whether their accountants have adequate knowledge. Furthermore, she thinks that relevant professionally qualified discussion partners are also important for the FARS (Brezavšček, 2017a).

With this, we have made the first, yet important, step towards regulating conditions in the market of accounting services. We must be aware that, as was stated by Dr. Koželj, accounting is too serious a profession to be performed by just any one (Brezavšček, 2017c).

4. The future development of accountancy in Slovenia and its international extension

Today we are establishing that the business, financial and wider social environment changes fast which also demands defined changes from accountants. So the future development of accountancy is according to the opinion of Slovene experts above all connected with (Korošec, 2007):

- the globalization and aggravation of competition,
- the pressure of owners and other interested groups on improving efficiency of managing and leading organisations as well as a bigger openness and clearness of operating
- the development of IT and
- risks connected with the company itself and with risks connected with accountancy itself.

Similar to other activities, the development of information technology and techniques will also affect work in accounting. These should contribute to relieving accountants of routine tasks and at the same time facilitate work in non-routine tasks, such as, facilitating the acquisition of databases for accounting analysis and forecasts related to the valuation of economic categories (Korošec, 2007). In short, process automation is inevitable which will lead to eliminating a number of simple tasks and a focus on substantive accounting and tax issues (Brezavšček, 2017c,). This will necessitate professional competence. As a result, accountants in the future will need more knowledge of business finance and other business disciplines (Korošec, 2007).

However, aggravated competition will lay greater stress on qualitative information for business decisions which is above all an opportunity for the development of management accounting. Inside of that the meaning of accounting budgeting and accounting analysis will increase. Likewise the direct integration of accountants into decision taking and their significance in counselling should increase. Newer tools of management accounting (analysis of intelectual intangibles) should be used and greater significance should be given to reporting with simultaneous and judicious way of reporting about non-numeric data (balanced score card) (Korošec, 2007, p. 150). With regard to this, Bergant (2017) also mentions that the development of accounting offers new information that influences the monitoring of business goals with new approaches, such as: activity based costing – ABC, productivity measurement models, quality measurement models, just-in-time delivery, economic value added (EVA), performance-based costing (PCB), activity- based management (ABM), throughput accounting, etc.

No matter what, reporting on the development capabilities of companies, which, according to traditional criteria, cannot be recognised as assets, will also be expected in the future. In connection with this, the increasing consideration of the sustainability dimension, in particular in relation to the environment and the role of human capital, will undoubtedly also be perceived. More and more people care about what kind of world we live in. Companies are therefore faced with the challenge of how and to what extent they can contribute to such endeavours. Not an easy problem to solve. Within this context, analysing the state of operations from the aspects of sustainability through a demonstration of activities required on the path to sustainable development can be an important basis that contributes to appropriate decision-making and planning of sustainable company operations (Vezjak, 2016).

Conclusion

Despite the fact that accounting is well-developed, we still cannot expect a more peaceful period in the future, as economic changes are always faster. In addition, we must not forget that a strong accountancy profession is a prerequisite for economic development in the region and the country. This is the conclusion of the IFAC survey conducted among the chairpersons and directors of IFAC member organisations in 91 countries, that is, the most responsible people for the profession in the world (Duhovnik, 2007). The fact is that a strong and respected accountancy profession instils investors with confidence. Therefore, it is appropriate for us to begin to understand that accounting is an indispensable factor in a company's success. And it is therefore right that each of us who is associated in any way whatsoever with accounting ensures proper education, and adheres to high professional and ethical standards and in this way strengthens the reputation of the profession. However, this kind of behaviour can also be encouraged on the basis of the finding that the crisis in Slovenia and in advanced economies did not affect the need for accountants. An analysis of the labour market shows that good accountants are highly sought after, and that the profession is deficient in that respect. Accountants are often first in line after directors. Mayer (2010) also adds that the accountant as the guardian of owners' assets is increasingly in a way independent of the director, since as such they report directly to supervisors or owners.

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Inženjering liderstva za uspešno poslovanje organizacije

Nevena Mihajlović[1], Marina Apostolovska[2]

[1] Mast. Eng. Management, nevenamihajlovic87@gmail.com
[2] Dipl. Eng. Management, marinaapostolovska@yahoo.com

Sadržaj: Liderstvo i promene su sinonimi. Menadžment je povezan sa efikasnošću, a liderstvo sa efektivnošću i promenama. Lider ima važnu ulogu za uspešno poslovanje organizacije i njegovi poslovi su jako važni, ali nisu hitni. Organizacija uspešno posluje na osnovu filozofije, funkcije i forme liderstva. Svaki zaposleni u organizaciji razvija liderske i timske veštine. Veština i sposobnost lidera je da brzo usvaja nova znanja, da prepozna savremene tokove i da ih implementira u buduće poslovanje organizacije. Odličan lider razvija osobine u kojima je iznad proseka i dovodi ih do savršenstva, njegova filozofija efektivnosti je: pojačaj osobine u kojima si snažan. Liderima se postavljaju zadaci koje će oni uspešno ispuniti ako shvate da je neprekidno učenje ono što liderima omogućuje visoke standarde i ambiciozne ciljeve.

Ključne reči: liderstvo, menadžment, organizacija, veštine, sposobnost.

Engineering Leadership in Successful Business Organization

Abstract: Leadership and change are synonymous. Management is linked to efficiency, and leadership with effectiveness and change. The leader has an important role to play for the successful operation of the organization and his work is very important, but not urgent. The organization operates successfully on the basis of philosophy, function and form of leadership. Every employee in the organization develops leadership and team skills. The skill and ability of the leader is to quickly acquire new knowledge, to recognize current trends and to implement them in the future business of the organization. An excellent leader develops the characteristics in which he is above the average and leads them to perfection, his philosophy of effectiveness is to: strengthen the strengths in which you are strong. Leaders set out tasks that they will successfully accomplish if they realize that continuous learning is what enables leaders to achieve high standards and ambitious goals.

Key words: leadership, management, organization, skills, competences.

1. Introduction

Prior to this work, I had the opportunity to talk to my colleagues more often about the issues of leadership that attracted me attention. Each conversation had the same outcome "Interesting, but what does it have to do with leadership?" - until I realized the essence of leadership. For scientific research, leadership is a very new thing, and as a term, very old. It is therefore necessary to define precisely and thoroughly what is implied by the leadership.

Leadership is a process in which one person affects other members of the group in order to achieve the defined goals of the organization. A person who influences dear people is called a leader. Although the definition of leadership is similar to the definition of management, there can not be a sign of equality between the terms manager and leader, and even less between leadership and leadership.

The six constants of leadership, according to Gardner (1996), are:

1. STORY: A leader must have a central story or message. It must be effective for a large and heterogeneous group. In crises, the story must be fast, which has the effect of simplifying the central message.
2. PUBLISH: Every, even the most eloquent story has no effect in the absence of the audience.

3. ORGANIZATION: Initially the leader speaks directly to the audience and achieves initial success. For an ongoing leadership, an institution based on an organizational base is necessary.
4. STORY: The creator of the story must in some sense be the embodiment of his story. This does not mean that he should be a saint, but not in contradiction with his basic message.
5. REFLECTION: Most creative leaders speak indirectly through a symbolic product that creates, while most political leaders speak directly to their audience. Direct dialing is more risky, but especially in the short term, it can be more effective and effective.
6. SKILL: Only those who achieve a high level of expert knowledge in their work or credibility in their lives have the chance to succeed as leaders. Direct leaders in principle have a lack of technical knowledge, while the power of indirect leaders is precisely based on their knowledge of specific things. (page 8)

2. Leader's Positions and Characteristics in Organization

Table 1: Time Management Matrix

	EMERGENCY WORKS	NON-EMERGENCY WORKS
IMPORTANT WORKS	**I** - crisis - problems - emergency meetings - emergency preparation	**II** - most preparations - planning - training - equalization
NON-IMPORTANT WORKS	**III** - interruptions in business - some meetings - some conversations - outbound activities	**IV** - trivial jobs - unimportant mail - non-business software - outbound activities

Source: Free Press, USA, 1996.

As we can see in the matrix, various activities take place at work (Covey, 1996):

- Some are urgent, some are not,
- some are important, some are not important.

Work is in practice going on at the following pace: First, urgent jobs are done in Quadrant I, then work on emergency operations in Quadrant III continues, then a person comes to take a little "nourishment" and drink coffee, spending time in Quadrant IV so that deals with Quadrant II, jobs that are of the highest importance, because only in the climate of these activities a vision of business and strategies for the future develops, the least time is spent. The job of the leader is the jobs in the II quadrant. The real leader is mostly concerned with the future, important but not urgent matters. This matrix shows us the necessity of having managers in the organization, since a large number of urgent activities are exactly the job of managers.

Character is the central part and the main pillar of the leader. Everything rests on him and stems from him, and the leader should:

- Make decisions thinking for the benefit of the organization, and to use their personal attitudes to influence decisions,
- To fulfill the given obligations and promises,
- to constantly work on oneself, to learn and to improve,
- It is always open for feedback,
- that everyone is available,
- To treat each associate with the same manners,
- not to make a difference between people at different levels in the organization,
- To trust people and always expect good intentions from them,
- to work team,
- not to be arrogant,
- Be consistent with obstacles, and

- to be elastic to change.

3. Foundations of Leadership in Organization

Leadership functions focus on the "business of leadership", that is, what the leader actually is doing. Leadership required by the organization is the leadership represented at all levels in the organization, each employee must make his own contribution to leadership functions in order for the organization to be successful.

Leadership function - enable, train, instigate - for the leader means (Block, 1991):

1. Be a teacher and mentor, bureaucratic behavior should be rooted.
2. Provide the necessary knowledge, skills and information for making good decisions.
3. Be proactive.
4. Remove barriers to training associates.

3.1 Organizational leader

The best way to arrive at an answer to the organizational leader would be to research the leader of effective companies. One such five-year research was conducted and published. (Collins, 2001). But first we give the sample data: from 1,435 Fortune 500 companies in the period from 1965 to 1995. the process of selection led to companies that had a growth index at least three times higher than the average of the New York Stock Exchange and held it for at least 15 years. We call such companies excellent. They had to be good companies, which had at least 1.25 times more stock growth than the stock market index. They had to be existing, not newly founded and that success did not come from the success of the industry. The final number of such companies was 11, with an average increase of 6.9 times that of the US economy. The dollar invested in these companies in 1965 after 30 years was worth 471 dollars, and the investment in the general market would have thrown off $ 56. In this paper they are compared with good companies of similar size and age, from the same branch and similar products and services. Also, a group of non-permanent companies has been inserted, the companies also have some similarities, but companies that have had a sharp peak in the growth and rapid decline, with less than 10 years of cycle time. It is important for excellent companies to say that the criterion was to keep the growth of shares at the time of the survey.

Level 1 stands for individual ability, level 2 teamwork skills, Level 3 Competent Manager, Level 4 Traditional Leader. Level 5 contains all of this from the past levels with a "extra dimension": a paradoxical mix of personal modesty and professional will. Level 5 leaders channel their ego away from you, and as a higher goal, creates a great company.

After publishing the book, Collins collected a large database of fifth-level leaders from all areas of society. He concluded that in the human population there are many more such leaders than ego-centric leaders, who are more represented in the media. Our culture and the media like leaders who are more-than-life, not silent, modest and effective leaders. The problem is not the lack of a fifth-level leader. They are around us. The dynamic changes that we are expecting in this century will place our greater attention on them in order for the economy and society to cope with the changes successfully because they are the key to their effective overcoming. The task of society will be to identify them, cultivate them and develop them. (Collins, 2001)

The effectiveness of the fifth-level leader in the 21st century will be based on the following assumptions (Collins & Drucker, 1999):

1. Leaders should define the interior and exterior of the organization according to the firm's values and vision of the organization, not according to traditional boundaries and limitations. They need to preserve values to stimulate progress.
2. Leaders should build a mechanism of bonding and obligation based on freedom of choice, rather than relying on coercion and control systems. Democratic values and the democratic organization of the organization appear as the inevitability of the election.

3. Leaders should accept the fact that true leadership is in reverse proportional to power-driven behavior. The real leader of the 21st century is only the one that people follow when they have the freedom not to do so.
4. Leaders should include reality in all their complexity. All the walls that existed as obstacles must not exist for the leaders of the 21st century, all obstacles should become archaic.

4. From Good to a Great Organization

By researching this topic, I discovered that "from good to excellent organization" does not come about by setting new strategies that the organization has to apply, and that people will then be led on the basis of them. Research has shown that this is not the case. Excellent companies first start by engaging the right people, and only then by placing plans. If the right people are employed the problem of motivation and management becomes much easier. You can not have a great company with the wrong people. Excellent companies will place the best people on jobs with the greatest chances, not the jobs with the greatest problems. Leaders of excellent companies are rigorous, not merciless.

For the best companies it is most important to face "brutal facts". Data for such companies are far more important than wishes. Such companies also have a "culture of discipline" that does not only emerge from the organization's system, but from people who work in that organization. Such companies use "technology" as an accelerator of development. For excellent companies there is a simple truth: the great power lies in the possibility of continual improvement and achievement of results.

5. Excellent Leader

The foundations of the leader are: (Zenger, 2002)

1. CHARACTER,
2. PERSONAL CAPACITY,
3. FOCUS ON RESULT,
4. INTERPERSONAL SKILLS,
5. MANAGEMENT OF ORGANIZATIONAL CHANGE.

There are five fatal disadvantages that guarantee failure in leadership:

1. Lack of ability to learn from mistakes.
2. Lack of interpersonal skills and competencies.
   a) A cold, rude, arrogant and egocentric manager
   b) Lack of basic social values and home improvement.
3. Lack of openness for new and different ideas.
4. Lack of responsibility for (un) achieved results.
5. Lack of initiative.

Removing these defects in their core has an increase in the emotional intelligence of an individual. Technically, proper and exhaustive feedback needs to be organized and used by its results.

An excellent leader becomes when someone with a natural gift, and based on practice, learning and experience, develops this gift perfectly. Other findings from this research are (Ibid, 15 - 28):

1. When compared with good leaders, excellent leaders make a big difference.
2. One organization can have many excellent leaders.
3. The goals are too low in the development of leadership abilities.
4. The relationship between improved leadership and higher performance exists and is stronger than linear.
5. An excellent leader contains several "basic blocks" of the foundations of the leader.
6. Leadership is a crucial and critical element in success in change.
7. Not all competences are equal, some distinguish good from excellent leaders, while others do not.
8. Leadership competencies are closely linked.
9. Effective leaders have different personal styles; There is not one real leader way.

10. Effective leadership practice is specific to each organization.
11. The key to developing excellent leadership is to increase the strong leadership of the leader.
12. A powerful combination produces an almost exponential positive result.
13. The lack of weakness is not the cause of great leadership.
14. Excellent leaders do not have great weakness.
15. Fatal defects must be corrected.
16. Leadership attributes are often corrected in non-linear and non-standard ways.
17. The leader is not born, the leader becomes.
18. Leaders can improve their effectiveness by self-build- ing.
19. The organization and direct superiors can make a significant contribution to the development of leaders.
20. The quality of the organization often can not be better and not better than the quality of the leader at the head of the organization.

6. Conclusion

When you look at what the organization needs to fulfill to succeed, it seems that there are many. The most important role in all of this is the leader, and it consists of: planning, team formation, delegating responsibility and authority, controlling, coaching and rewarding.

Is leadership really so critical? An Internet research (Bennis, 2003) through Google, on the question of lack of leadership, produced 27,000 responses, each reporting a lack of leadership in various world and national organizations and institutions, virtually in every field of human life. One of the cover stories of Time magazine cried out: "The nation calls the leaders, but there is no one at home". (Loc. Cit.)

The situation is not so critical if it is immediately reacted. The task of becoming a successful leader as needed in today's world is not at all easy; however, numerous studies have shown that leadership potential lies in many, only with continuous learning, because it allows leaders to have high standards, ambitious goals.

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Kompetentnost u upotrebi elektronskih servisa državne uprave u Srbiji

Jasmina Đurašković[1]

[1]NCR Corporation, jasmina.djuraskovic@gmail.com

Apstrakt: Istraživanje prikazano u radu imalo je za cilj da ispita ocenu kompetentnosti državnih i poslovnih subjekata, kao i građana, u korišćenju servisa e-uprave. Analiza kompetentnosti, kao jedne od ključnih determinanti razvoja e-uprave u Srbiji, izvršena je na osnovu podataka prikupljenih anketiranjem predstavnika vlade, nevladinog sektora i akademske zajednice, uključenih u proces razvoja, uvođenja i praćenja funkcionisanja sistema elektronske uprave u Srbiji. Za obradu podataka, osim deskriptivnih analiza, korišćeni su i t-testovi, analize varijanse za ponovljena merenja i Pirsonove produkt-moment korelacije. Prema rezultatima istraživanja, i kompetentnost građana i kompetentnost poslovnog sektora, kao korisnika usluga e-uprave, ocenjene su višim ocenama od kompetentnosti državnih službenika u primeni i upotrebi e-uprave, mada su i ove dve stavke ocenjene neznatno iznad proseka.

Ključne reči: e-uprava, e-servisi, kompetentnosti u korišćenju servisa e-uprave

Competence of Using the Electronic Government Services in Serbia

Abstract: The research presented in this paper aimed to examine the assessment of the competence of state and business entities, as well as citizens, in the use of eGovernment services. Analysis of competence, as one of the key determinants of the development of e-government in Serbia, was based on data collected by surveying a representative of the government, NGOs and academics, involved in the development, implementation and monitoring of the functioning of e-government in Serbia. For data processing, in addition to descriptive analysis, are also used t-tests, variance analysis for repeated measurements, and Pirson's product-moment correlation. According to the results of the research, both the competence of the citizens and the competence of the business sector, as users of eGovernment services, were rated by higher assessments then the competences of civil servants in the application and use of eGovernment, although these two items were also slightly below the average.

Keywords: e-government, e-services, e-government competencies

1. Uvod

Razvoj i upotreba informaciono-komunikacionih tehnologija (IKT), a posebno interneta, promenili su način poslovanja privrednih subjekata u poslednjih dvadeset godina, pružajući niz novih mogućnosti za unapređenje inovativnosti i konkurentnosti. Danas se savremena IKT smatra osnovom razvoja društva znanja, u kome posebna uloga pripada konceptu elektronske uprave. Prelazak na elektronsku upravu podrazumeva menadžersku revoluciju i proces institucionalnih i političkih reformi, podržan novim tehnologijama (Rubino-Hallman and Hanna, 2006).

Glavni problem razvoja e-uprave, generalno posmatrano, jeste u tome što ona kao javni servis, u skladu sa svim svojim obavezama, nije u poziciji da se lako i brzo oslobodi postupaka zasnovanih na papirologiji i to istog trenutka kada se pojavi mogućnost za primenu elektronskih usluga. Očekivane dobiti od bilo kojih usluga e-uprave, u skladu sa tim, ne mogu odmah da se materijalizuju. Prednosti, kao što su povećana efikasnost uprave i transparentnost, mogu da se ostvare samo u trenutku kada internet postane dominantan način komunikacije društvenih subjekata sa javnom upravom (Tung and Rieck, 2005). Međutim, za uspeh koncepta elektronske uprave nije dovoljno samo obezbediti informacije i usluge, neophodno je i osigurati odgovarajuće kompetentnosti svih subjekata koji koriste servise e-uprave, kako zaposlenih u državnom sektoru, tako i privrednika i građana.

2. Teorijski okvir istraživanja

Ubrzani napredak i stalne promene u oblasti informacionih i komunikacionih tehnologija (IKT) doveli su do potrebe inoviranja kanala komunikacije, na svim nivoima vlasti i modernizacije državne administracije. Razvojni projekti e-uprave, zbog svoje kompleksne prirode, imali su šire političke, socijalne i ekonomske posledice na čitavo društvo (Mishra et al., 2012). Danas se e-uprava posmatra kao sredstvo za smanjenje birokratije, povećanje efikasnosti i efektivnosti javnog servisa i jačanje demokratskih struktura (Rowley, 2011).

Mnoga prethodna istraživanja istakla su postojanje jaza između kvaliteta vladine ponude i nivoa upotrebe usluga e-uprave (OECD, 2009). Brojni su faktori koji otežavaju digitalnu saradnju vlade i korisnika i dovode do formiranja komunikacionog jaza, kako na strani ponude, tako i na strani tražnje.

Analizirajući faktore na strani ponude (vlade), kao najznačajnije prepreke za razvoj e-uprave, ističu se: otpor zaposlenih u državnom sektoru - organizacione barijere (Schwester, 2011), nedovoljna podrška političara i kreatora ekonomske politike (Sarkar, 2007), nedostatak adekvatne promocije i široke medijske podrške (Schwester, 2011), nedostatak znanja i iskustva u održavanju IT sistema (West, 2004) , neodgovarajuće cost/benefit analize, kao osnova eGovernment inovacija (Eynon, 2007), niska stopa penetracije interneta i nerazvijena infrastruktura (Delopoulos, 2010), kao i nedostatak odgovarajućeg zakonodavstva i pravnog okvira (AlShihi, 2005). Izazovi u procesu modernizacije državnog sektora posebno su složeni u zemljama u razvoju, gde lokalna prilagođavanja elektronske uprave imaju presudan uticaj (Hamner et al., 2010).

Faktori koji na strani tražnje otežavaju proces implementacije e-vladinih projekata uključuju: problem bezbednosti i zaštite podataka (United Nations, 2003), troškove nabavke, održavanja IT opreme i troškove pristupa internetu (European Commission, 2008), nepoznavanje vladine ponude elektronskih usluga (Chen and Dimitrova, 2006), komplikovano korišćenje e-servisa (European Commission, 2003), nedostatak poverenja u internet, kao alat komunikacije (Rana et al., 2013), nezadovoljstvo sadržajem veb-portala (nedovoljno ažurirani podaci) (Alshehri et al., 2012), kao i kvalitetom usluga e-uprave (neprilagođenost specifičnim potrebama korisnika) (Weerakkody i Dhillon, 2008). Veoma je bitno da kreatori ekonomske politike, pri donošenju strategija razvoja informacionog društva, uzmu u obzir i uočene barijere, jer empirijski je dokazano da uspeh takvih inicijativa ne zavisi samo od vladine podrške i faktora koji deluju na strani ponude, nego i od spremnosti građana da prihvate i usvoje elektronske usluge (Carter i Belanger, 2004). Digitalizacija javne uprave je složen proces koji zahteva duži vremenski period, i stoga sveobuhvatan i integrativan pristup (Ebrahim & Irani, 2005), a predviđene koristi od uvođenja e-uprave mogu se realizovati samo ako se uočene prepreke prevaziđu.

Zahvaljujući promeni paradigme i postavljanju korisnika u centar istraživanja, više pažnje se poklanja i kontekstu razvoja elektronske uprave (socio-ekonomskim, organizacionim, institucionalnim i dr. faktorima) (OECD, 2009). Nejednak uspeh u procesu implementacije elektronskih javnih servisa posledica je, ne samo kvaliteta vladine ponude, nego i delovanja brojnih drugih faktora iz okruženja (Dwivedi et al, 2012). Analizirajući faktore uspešnosti implementacije e-uprave, Zhao (2013) uviđa postojanje veze između različitih dimenzija nacionalne kulture i razvoja e-uprave, što može otežavati ili podsticati inicijative e-uprave.

Uopšteno posmatrano, relativno je malo istraživanja, u oblasti elektronske uprave, koja su sprovedena u tranzicionim i manje razvijenim zemljama, u odnosu na politički stabilne i razvijene tržišne privrede. U skladu sa tim, u akademskoj literaturi prisutan je nedostatak sveobuhvatnog, holističkog okvira procene potencijala elektronske uprave, uzimajući u obzir sve kritične faktore, koji deluju u postkomunističkim zemljama (Ramaswamy and Selian, 2007).

Prethodna istraživanja su potvrdila postojanje razlike između razvijenih i ostalih zemalja, po pitanju širenja elektronskog javnog servisa (Brown & Thompson, 2011). Većina usvojenih strategija za razvoj elektronske uprave zasniva se na uspešnim iskustvima iz razvijenih zemalja, koja ne mogu biti neposredno primenjena na zemlje u razvoju. Poslednjih godina se u razvijenim zemljama beleži značajan napredak u procesu implementacije e-uprave (United Nations, 2010), što dodatno produbljuje postojeći jaz i povećava zaostatak manje razvijenih zemalja za liderima, u oblasti digitalizacije državne uprave. Prema Azad et al. (2010), ova nejednakost se objašnjava delovanjem institucionalnih faktora, koji podrazumevaju: demokratsku praksu, transparentnost poslovanja privatnog sektora, percepciju

korupcije i slobodu medija, dok drugi autori ovu temu smeštaju u širi kontekst, uzimajući u obzir i delovanje istorije i kulture, infrastrukture, građana i zaposlenih u vladinom sektoru, sa posebnim osvrtom na njihove IT sposobnosti i kompetentnosti (Chen et al., 2006). U daljem radu, posebna pažnja je posvećena pitanju kompetentnosti svih korisnika servisa e-uprave.

3. Metodologija rada

Istraživanje kompetentnosti, kao jedne od ključnih determinanti razvoja e-uprave u Srbiji, sprovedeno je u četiri faze. Kako bi se utvrdio širi kontekst razvoja e-uprave, u prvoj fazi istraživanja, urađena je desk analiza, kojom je obuhvaćena razvijenost nacionalnih strateških i akcionih planova, kao i pregled aktuelnih zakona. Analiza je dopunjena i kvantitativnim indikatorima iz relevantnih istraživanja Republičkog zavoda za statistiku. Materijal korišćen u analizi prikupljen je na zvaničnim internet prezentacijama državnih institucija. Za potrebe ovog istraživanja nije pronađen ni jedan dokument (objavljen u poslednjih šest godina), koji se bavi detaljnom analizom stepena razvijenosti e-uprave u Srbiji, kao i IT veštinama korisnika elektronskih servisa.

Godišnje izveštaje o stanju razvoja eUprave u Republici Srbiji objavljivao je Republički zavod za informatiku i internet (od 2008. do 2010. godine). U ovim izveštajima analizirani su ključni elementi razvoja eUprave (primena Strategije razvoja informacionog društva, trenutno stanje pravnog okvira eUprave, akteri razvoja eUprave i njihove nadležnosti, infrastruktura i elektronski servisi). Poslednja publikacija te vrste izdata je za 2009. godinu. Nakon rekonstrukcije Vlade Republike Srbije u martu 2011. godine, Zavod za informatiku i internet prestao je sa radom, a njegove nadležnosti preuzela je novoosnovana Uprava za Digitalnu agendu (kasnije Direkcija za elektronsku upravu). Međutim, Uprava za Digitalnu agendu nije nastavila sa praksom praćenja ključnih elemenata u oblasti razvoja e-uprave. Od kada je počeo sa radom nacionalni portal eUprava (u junu, 2010. godine), pažnja je usmerena na unapređenje kvaliteta prezentacija državnih organa i jedinica lokalne samouprave, kroz izradu kriterijuma i smernica za razvoj njihovih vebprezentacija, a prilično je zapostavljena strana korisnika.

U drugoj fazi istraživanja, nakon desk analize, kreiran je upitnik za procenu kompetentnosti. U istraživanju je korišćen upitnik, konstruisan po uzoru na prethodno sprovedeno istraživanje Vu i West (2005), koje je imalo za cilj analizu uticaja različitih faktora na potencijal razvoja e-uprave u Vijetnamu.

U trećoj fazi identifikovani su odgovarajući subjekti za učestvovanje u istraživanju. Skup potencijalnih ispitanika se sastojao, sa jedne strane, od predstavnika državnih institucija i organa državne uprave, odgovornih za razvoj i uvođenje sistema elektronske uprave (kako u domenu izrade strateško-planskih dokumenata, tako i u domenu implementacije donetih mera i aktivnosti). Sa druge strane, istraživanjem su obuhvaćene i organizacije iz nevladinog sektora, koje predstavljaju partnere države u procesu reforme javne uprave, uvođenja elektronskih servisa i uspostavljanja koncepta elektronske države. Takođe, ovaj skup je obuhvatio i predstavnike akademske zajednice, uključene u praćenje i analizu razvoja e-uprave u Srbiji. Na ovaj način odabrani su subjekti koji su najviše upoznati sa pitanjem kompetentnosti, neophodnih za korišćenje e-uprave i koji su, samim tim, najprikladniji da učestvuju u anketiranju (finalni skup se sastojao od 76 ispitanika).

Prema načinu izbora jedinica, u istraživanju je primenjen kombinovani uzorak i to kombinacija namernog uzorka (uzorka tipičnih jedinica) i uzorka izabranog primenom metode grudve snega (snowball sample). Uzorak tipičnih jedinica obuhvata jedinice koje su tipične (reprezentativne) za istraživano pitanje (zove se još i ekspertni - namerni uzorak (expert sample)). Uzorak formiran po principu snežne grudve predstavlja oblik prigodnog uzorka, koji se najčešće upotrebljava prilikom istraživanja pojava na malim ili teško dostupnim populacijama. Inicijalni skup ispitanika, odabran po odgovarajućim kriterijumima (u ovom slučaju, uzorak tipičnih jedinica), usmerava istraživača na druge ispitanike, koji ispunjavaju postavljene kriterijume. Ovaj metod uzorkovanja je izabran s obzirom na realno ograničenje istraživanja, koje se odnosi na veoma malu veličinu populacije.

Prvo su, kao polazna osnova, izabrani organi državne uprave i ministarstva nadležna za razvoj i sprovođenje sistema elektronske uprave u Republici Srbiji (Ministarstvo državne uprave i lokalne samouprave, Direkcija za elektronsku upravu, Ministarstvo trgovine, turizma i telekomunikacija, Ministarstvo unutrašnjih poslova, Privredna komora Srbije, Poreska uprava, Agencija za privredne

registre (APR), Narodna banka Srbije (NBS), Regulatorna agencija za elektronske komunikacije i poštanske usluge (RATEL) i Uprava za zajedničke poslove republičkih organa (UZZPRO)), zatim organizacije civilnog društva – partneri države u projektima uvođenja elektronske uprave (Nacionalna alijansa za lokalni ekonomski razvoj (NALED), Stalna konferencija gradova i opština (SKGO), Transparentnost Srbija (TS), Centar za istraživanje, transparentnost i odgovornost (CRTA)), organizacije koje su organizatori konferencija na temu razvoja i funkcionisanja elektronske uprave (Asocijacija za računarstvo, informatiku, telekomunikacije i nove medije Srbije (ASIT), Registar nacionalnog Internet domena Srbije (RNIDS), Udruženje e-Razvoj, Jedinstveni informatički savez Srbije (JISA)), kao i nosioci projekata promovisanja nacionalnog portala eUprava (Fondacija za otvoreno društvo, USAID, Nacionalni demokratski institut i Edukacioni centar). Zatim je izvršen pregled domaće citatne baze (SCIndeks) i međunarodnih citatnih baza podataka (Web of Science, Scopus i Google Scholar), kako bi se izdvojili naučnici čiji istraživački rad pripada oblasti digitalizacije javne uprave.

Konačno, u četvrtoj fazi realizovano je finalno istraživanje. Istraživanje je sprovedeno metodom anketiranja izabranih subjekata, korišćenjem zatvorenog upitnika, koji je distribuiran elektronskim putem, korišćenjem Guglove aplikacije za kreiranje, distribuciju i analizu upitnika. Online upitnik, postavljen u formi Gugl dokumenta, bio je dostupan ispitanicima 56 dana (od 2. aprila do 28. maja 2016. godine). U tom periodu potencijalnim učesnicima istraživanja poslate su dve poruke putem elektronske pošte, jedna se odnosila na poziv za učešće u istraživanju, a druga na podsetnik za one koji se nisu odazvali. Svi subjekti su osnovne informacije o istraživanju i jasna i detaljna uputstva za popunjavanje upitnika dobili zajedno sa adresom za pristup upitniku. Takođe, u uvodnom delu upitnika, navedeni su nosioci istraživanja i njihovi kontakt podaci, kako bi se ispitanici mogli javiti, ukoliko imaju dodatna pitanja ili sugestije.

4. Rezultati istraživanja

Registrovana su ukupno 44 unosa u elektronski upitnik, od kojih tri unosa nisu bila validna (imala su više od polovine nedostajućih podataka). Konačan realizovani uzorak obuhvatio je 41 ispitanika. S obzirom da je uzorak izabran primenom metode grudve snega (nepoznat konačan broj subjekata kojima je upućen poziv za učešće u istraživanju) nije bilo moguće izračunati stopu odgovora.

S obzirom na polnu strukturu, gotovo je bila ravnomerna raspodela ispitanika u uzorku (48.8% ispitanika ženske polne pripadnosti i 51,2% muške polne pripadnosti). Najbrojnija starosna grupa su bili ispitanici između 31 i 40 godina starosti, koji čine malo manje od polovine uzorka (46%). Najmanji udeo u uzorku čine ispitanici starosne dobi preko 50 godina života (12%).

S obzirom na zastupljenost sektora u uzorku, najveći procenat ispitanika pripada javnoj upravi (63%), značajno manje sektoru za naučnoistraživački i obrazovni rad (20%) i najmanji udeo zauzimaju ispitanici iz neprofitnog sektora (17%).

Iznenađuje niska zainteresovanost predstavnika akademske zajednice za učešće u istraživanju (samo osam ispitanika popunilo je upitnik), uzimajući u obzir da se sadržaj ankete odnosio i na njihovo polje interesovanja. Najviša stopa odgovora registrovana je od strane zaposlenih u javnom sektoru (preciznije u državnoj upravi). Međutim, treba napomenuti da je i najviše poziva za učešće u anketiranju upravo poslato ovom segmentu ispitanika.

Podaci su obrađeni u statističkom softveru SPSS 20. Izuzev deskriptivne analize, korišćeni su i t-testovi, analiza varijanse za ponovljena merenja i Pirsonove produkt-moment korelacije. Nakon deskriptivne analize, izračunata je prosečna ocena ispitanika za analiziranu varijablu (kompetentnost). Nakon toga su ispitane razlike u procenama ispitanika, u zavisnosti od njihove sektorske pripadnosti (da li pripadaju javnom sektoru, nevladinom sektoru ili sektoru za naučnoistraživački rad).

Od ispitanika je traženo da procene stepen kompetentnosti subjekata za upotrebu e-uprave, na skali od 1 do 5 (gde je 1 veoma slaba, 2 slaba, 3 srednja, 4 jaka i 5 veoma jaka). Prosečne procene ispitanika i standardne devijacije za sve tri stavke date su u narednoj tabeli.

Tabela 1. Procena razvijenosti nivoa kompetentnosti subjekata za upotrebu servisa e-uprave

Stavka	Br.	AS	SD	Faktor
Kompetentnost državnih službenika u primeni i upotrebi e-uprave	1.	2.44	0.84	Kompetentnost
Kompetentnost poslovnog sektora u korišćenju usluga e-uprave	2.	3.05	0.89	Kompetentnost
Kompetentnost građana u korišćenju usluga e-uprave	3.	2.86	0.97	Kompetentnost

Napomena: AS – aritmetička sredina; SD – standardna devijacija.

U tabeli 1. vidljivo je da procena ni za jednu od tri analizirane stavke ne prelazi značajnije prosečnu razvijenost. Kao razvijenija (ocena preko 3) ocenjuje se „Kompetentnost poslovnog sektora u korišćenju usluga e-uprave", dok su preostale dve stavke ocenjene ispod prosečne vrednosti. Ovi rezultati ukazuju da je poslovni sektor, iako i sam umereno spreman, najspremniji da prihvati e-upravu, u pogledu raspolaganja odgovarajućim kompetentnostima za upotrebu elektronskih servisa od strane zaposlenih.

Posebnu pažnju privlači podatak da su i kompetentnost građana i kompetentnost poslovnog sektora, kao korisnika usluga e-uprave, ocenjene višim ocenama od kompetentnosti državnih službenika u primeni i upotrebi e-uprave, iako više od polovine ispitanika upravo čine zaposleni u državnoj upravi (čak 63%). Ispitanici su ovu stavku ocenili znatno ispod proseka (2.44), što ukazuje da su i oni svesni nedostataka u ovom segmentu razvoja e-uprave.

Na kraju je uzeto u obzir i da li ispitanik pripada javnoj upravi (63.4%) ili pripada sektoru za naučnoistraživački i obrazovni rad i neprofitnom sektoru (36.6%)[3] prilikom posmatranja visine procene tri stavke. Procene ispitanika iz date dve grupe za sve stavke upoređene su upotrebom serije t-testova. Rezultati su pokazali da ne postoji statistički značajna razlika u proceni analiziranih stavki između ove dve grupe ispitanika. Postoji samo marginalna statistička značajnost u pogledu ispitanika koji pripadaju ili ne pripadaju javnom sektoru odnosno ispitanici zaposleni u javnom sektoru imaju tendenciju da daju nešto više ocene na sve tri stavke kompetentnosti, nego ispitanici koji nisu zaposleni u javnom sektoru. Ipak, trebalo bi prikupiti dodatne podatke iz drugih izvora kako bi se našla dodatna potpora ovom nalazu.

5. Diskusija i zaključak

Kritičan faktor uspešne implementacije e-uprave jeste prihvatanje i upotreba servisa od strane potencijalnih korisnika, koji, da bi prihvatili internet kao način komunikacije sa državom, treba da budu informisani, a pre svega obučeni i edukovani za korišćenje elektronskih usluga (Sarrayrih i Sriram, 2015). Značaj obuke zaposlenih za upotrebu elektronskih servisa, potvrđuju i brojna istraživanja.

Alomari et al. (2009) utvrdili su glavne faktore koji utiču na usvajanje e-uprave. Prema rezultatima istraživanja, izdvojene su četiri grupe faktora (koje su poređane po stepenu važnosti): bezbednost i privatnost podataka, poverenje u vladu, digitalna pismenost korisnika i pristupačnost elektronskih usluga. Istražujući prepreke za prihvatanje e-uprave u zemljama u razvoju, Abu-Shanab (2014) zaključio je da nedostatak tehničke podrške za upotrebu elektronskih servisa državne uprave predstavlja najznačajniju prepreku, nakon čega sledi nedostatak znanja u pogledu korišćenja usluga e-uprave.

Bez obzira na postojanje prepreka finansijske prirode, postoji volja i zainteresovanost privrednih subjekata za proširenjem znanja i unapređenjem veština u oblasti informacionih tehnologija. Predstavnici poslovnog sektora u Srbiji pokazali su veliko interesovanje za dodatnu edukaciju kroz poslovne i stručne obuke, u okviru projekta „Promocija elektronskih komunikacija i informacionog društva među preduzetnicima i malim preduzećima". Pored pitanja elektronske trgovine, elektronskog poslovanja i elektronskog bankarstva, jedna od tema predavanja, u okviru ovog projekta, bila je i elektronski dokumenti i e-uprava (ENECA, 2012).

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[3] Zbog malog broja ispitanika u tim grupama, ispitanici iz sektora za naučnoistraživački i obrazovni rad i ispitanici iz neprofitnog sektora svrstani su u jednu grupu.

Badri & Alshare (2008) istakli su ulogu Vlade u podsticanju društva na organizaciono učenje, pružanjem potpunih, transakciono orijentisanih elektronskih usluga. Na taj način bi poslovni subjekti unapredili svoje performanse i održali konkurentnost na tržištu. Pored motivacije, potrebno je da Vlada, u saradnji sa nevladinim organizacijama i udruženjima poslodavaca, obezbedi sveukupan i koordinisan program treninga, seminara i radionica za korisnike sistema e-uprave. Cilj predloženih programa je obezbeđenje potrebnih znanja i veština za sve grupe korisnika (građane, privredu i javni sektor) kako bi se osigurala optimalna upotreba elektronskih servisa državne uprave. Država primetno više finansijskih sredstava (iz sopstvenih izvora - nacionalnog budžeta, ali i iz fondova Evropske unije) ulaže u podizanje nivoa digitalne pismenosti zaposlenih u državnim institucijama, posebno na nivou jedinica lokalne samouprave (zbog činjenice da se više od 70% propisa i standarda EU sprovodi na lokalnom nivou), dok se značajno manje pažnje poklanja organizovanju predavanja, seminara i specijalizovanih kurseva radi usavršavanja i obuke poslovnih subjekata i građana za upotrebu elektronskih servisa.[4] Većina realizovanih obuka za predstavnike privrede, koja je organizovana od strane konsultantskih organizacija i centara za edukaciju, podrazumeva značajnu finansijsku nadoknadu (najčešće uz pretplatu za dobijanje obaveštenja i savetovanje na godišnjem nivou), što može biti prepreka za edukaciju i unapređenje znanja, veština i kompetencija poslovnih subjekata.

Pored ulaganja u informatičko obrazovanje zaposlenih u državnim organima (na centralnom i na lokalnom nivou), neophodno je podizanje nivoa digitalne pismenosti i svih korisnika elektronskih servisa (građana i poslovnih subjekata), kao preduslova za uspešnu reformu državne uprave i proces integracije Srbije u Evropsku uniju.

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Inženjering procesa motivacije zaposlenih
Bojana Pavlović[1]

[1]Fakultet za inženjerski mendžment, office@fim.rs

Apstrakt:U svakom trenutku čoveka pokreću više različitih motiva. U radnoj situaciji nismo uvek u mogućnosti, iz različitih razloga, da sledimo svoje potrebe i motive. Ponašanje čoveka u procesu rada je veoma često nepredvidivo i veoma teško ga je razumeti. Pre svega to se odnosi na radne situacije u kojima nisu u potpunosti jasne propozicije i gde ne postoje zajednički interesi i vrednosti. Ne postoje trajne formule za motivaciju zaposlenih, nema kalkulacija koje donose trenutne uspehe u motivisanju, nema pravila koja važe u svakom pojedinačnom slučaju. Područje upravljanja ljudskim resursima se u obalsti motivisanja zaposlenih suočava sa nizom problema na koje ne zna uvek prave odgovore. Današnji menadžeri imaju složen zadatak da se i sami pripreme za nove oblike premnosti na promene, za samomotivisanje i da tek tada mogu ozbiljno da se pozabave motivisanjem zaposlenih. Promene u poslovnom svetu koje se svakodnevno dešavaju, kreću se u pravcu traženja mogućnosti za život kojim bi čovek današnjice bio zadovoljniji.

Ključne reči: Motivacija, emocija, inženjerski menadžment, motivacija za rad, motivacija za kvalitet

Motivation Engineering of Employees

At any moment, people start different motives. In the work situation, we are not always able, for various reasons, to follow our needs and motives. Man's behavior in the work process is very unpredictable and very difficult to understand. First of all, this refers to working situations in which there are not completely clear propositions and where there are no common interests and values. There are no permanent employee motivation formulas, there are no calculations that bring current motivation success, there are no rules that apply in each individual case. The human resource management area faces a number of problems in the margins of employee motivation, which it does not always know how to answer. Today's managers have a complex task to prepare themselves for new forms of change for change, for self-motivation, and only then can they seriously deal with the motivation of employees. Changes in the business world that happen every day are moving in search of opportunities for life that would make the man happy today.

Key words: Motivation, emotion, engineering maangemetn, work motivation, quality motivation

Uvod

U današnje vreme za većinu ljudi simbole uspeha predstavljaju fizičke tj. materijalne stvari. Svaki čovek živi u tri ravni svoga postojanja:

- Spiritualnu – najvišu ravan – čine misli;
- Intelektualnu – srednju ravan – čine ideje;
- Materijalnu – najnižu ravan – čine fizičke stvari.

Da bi čovek uspeo i zadovoljio svoj ego, vitalni centar svesti ili svoje vidljivo ja, nije dovoljno da se ostvari samo u najnižoj ravni. Uspeh je upravo na najvišem nivou, da čovek svojim mislima dokuči šta je ono što je svrha i smisao njegovog života, a potom da pronađe put i način kroz idejnost kako da postigne određeni rezultat.

Rezultat se postiže neprekidnim kretanjem čovekovog organizma tj. pokretanjem organizma na aktivnost. Bilo da aktivnost predstavlja zadovoljenje najosnovnijih i egzistencijalnih potreba, kao što su voda, hrana, san, odeća i druge pa preko potreba sigurnosti za osećanjem zaštite od opasnosti, sigurnost od ekonomskih poteškoća i potreba za sigurnim poslom, pa potreba da se bude u društvu drugih ljudi,

da se bude prihvaćen tačnije rečeno socijalizovan, da se bude dostojanstven, poštovan, samopoštovan, stručan, priznat od strane socijalnog okruženja, pa sve do onih najviših potreba za ostvarenjem sopstvenih potencijala tj. samoaktualizacijom, ljudski organizam je u stalnom pokretu. Za postojanje tih pokreta i uopšte aktivnosti ljudskog organizma zadužena je motivacija.

Slika 1: Maslovljeva teorija potreba (Izvor: Rot, 2017, strana 285)

Motivacija predstavlja jedan od najopštijih pojmova koji se odnose na pokretanje čovekovog organizma. Ali u svakom tom pokretu ona nije sama. Ima puno svojih pomoćnika koji joj pomažu u toj aktivnosti a to su osnovni pojmovi motivacije:

1. Potreba – nedostatak određenih materija u organizmu i nužnost da se one nadoknade u cilju normalnog funkcionisanja organizma i održavanja života. Opisana potreba je fiziološka ili organska potreba. A pored nje postoji i psihološka potreba tj. ono što čoveku psihološki nedostaje.
2. Nagon – svako svesno doživljavanje potrebe kao što je glad, žeđ, itd.
3. Želja – predstavalja jedan privlačan cilj koji treba da zadovolji postojeću potrebu i usmerena je na određen, konkretan objekat. Javlja se kada uz potrebu i nagon postoji predstava privlačnog cilja koji može da zadovolji postojeću potrebu.
4. Težnja – predstavlja neodređeni motiv i ona je usmerena ka nekoj vrsti objekta.
5. Namera – vezena je za voljnu radnju i odluku. Ukoliko postoji motiv, svesno voljno prihvatanje tog motiva i postavljanje cilja koji treba da se ostvari, onda govorimo o nameri (Rot, 2017).

Motivacija u inženjerskom menadžmentu

Motivacija je jedna od važnijih tema u oblasti inženjerskog menadžmenta. Razlog tome je vrlo jednostavan, jer organizacije ostvaruju ciljeve tako što zaposleni i menadžeri iz oblasti inženjerstva u njima ostvaruju svoje radne učinke.

Ostvarivanje učinaka zaposlenih i menadžera je rezultat 3 grupe faktora:

1. Sposobnosti zaposlenih da ostvare učinak;
2. Šanse zaposlenih da ostvare učinak;
3. Volja ili motivacija zaposlenih da ostvare učinak.

Sposobnost zaposlenih da ostvaruju učinke se postiže njihovim obrazovnjem i obukom na poslu. Priliku zaposlenima da ostvaruju učinke pruža organizaciona struktura preduzeća. Međutim, može zaposleni da bude kompetentan za ostvarivanje učinaka, možda mu organizacija omogućuje ostavrenje učinaka - ipak sve to neće vredeti ukoliko on sam nije motivisan za ostavrenje učinaka (Goleman, 1997; Dil, 1978; Bojanović, 1979).

Mnogo je puta dokazano da motivaciju prate razne emocije i motivi. Ove dve reči predstavljaju termine oko čijeg tačnog značenja se psiholozi i filozofi spore više od jednog veka. Jedno je sigurno tačno a to je da koren reči *emocije* i *motivi* potiče od latinskog glagola *motere* što znači *kretati se*, *kretati se unapred*, što bi dalje značilo da je tendencija za delanjem prirođena svakoj emociji ili motivu. Emocije

su ono što nas pokreće da ostvarimo svoje ciljeve, one hrane našu motivaciju a motivi za uzvrat pokreću našu percepciju i oblikuju naše aktivnosti. Sama motivacija je emocionalna sklonost koja vodi postizanju i ostvarenju ciljeva a ujedno ih i olakšava. Emocija je i bilo koje uzrujavanje ili uznemirenje uma, osećanja, strasti. Ona je i bilo kakvo mentalno stanje besa ili nespokojstva. Kao i osećanja i raznolika mišljenja, psihološka ili biološka stanja i raspon mogućnosti ponašanja. Znači emocije su ono što nas pokreće da ostvarimo svoje ciljeve, one na neki način hrane našu motivaciju (Goleman, 1997; Dil, 1978; Bojanović, 1979).

U zavisnosti od situacije u kojoj se nalazimo naše emocije se formiraju u skladu sa dosadašnjim načinima na koje smo naučili da ih usvajamo i obrađujemo i od načina na koje nas je socijalno okruženje usmerilo da ih iskazujemo. Veoma često naše emocije zavise i potiču od određene vrste iskrivljenog mišljenja zasnovanog na predubeđenju. Predrasuda je da mišljenje znači odsustvo emocionalnosti, kao što je i predrasuda da su emocije odsustvo mišljenja. Emocija veoma često prati moćnu i neargumentovanu misao koju možemo definisati kao izvesnu vrstu prinudnog razmišljanja zasnovanu na pogrešnim opažanjima koja je često praćena i specifičnim telesnim reakcijama i spremnošću za akciju koja nije uvek razumna.

Da bismo izbegli reagovanja sa kojima ni sami kasnije nismo saglasni, veoma je važno jasno prepoznati i negovati mišljenje koje ne dovodi do razvoja pogrešnih emocija i loših doživljaja. To mišljenje je zasnovano na objektivnim činjenicama koje se suprotstavljaju subjektivnoj proceni i njime smanjujemo mogućnosti za konflikte sa okolinom i lakše i brže definišemo sopstvene ciljeve. Ozbiljnije, naučno bavljenje motivacijom, počinje tek sa razvojem industrije, početkom tridesetih godina prošlog veka i doživljava kulminaciju poslednjih tridesetak godina (Goleman, 1997; Dil, 1978).

Visoka motivisanost zaposlenih u kompanijama razvijenog sveta nije povezana samo sa povećanjem postojeće konkurentnosti - ona se smatra suštinskim elementom dugoročnih planova za 21. vek. Izučavanje motivacije za rad u osnovi ima dva najvažnija cilja:

- poboljšanje efikasnosti, kreativnosti i kvaliteta rada
- humanizovanje uslova rada, to jest poboljšanje kvaliteta radnog života.

Šta je motivacija za rad a šta je motivacija za kvalitet?

Postoje brojne i različite definicije motivacije za rad. Za operativnu upotrebu pogodna je definicija prema kojoj motivaciju za rad čine faktori koji pokreću, organizuju, usmeravaju i određuju intenzitet i trajanje radne aktivnosti. Služeći se jezikom inženjera menadžmenta, motivaciju možemo definisti kao ono čime se obezbeđuje da se ljudi ponašaju na poželjan način, čime se postižu ciljevi organizacije i istovremeno zadovoljavaju porebe zaposlenih ili još kraće: motivacija je sposobnost rukovodioca da iz prosečnog saradnika izvuče maksimum.

Motivisanje se određuje još i kao:

- Podsticanje, uticaj, inspirisanje i stimulisanje osoblja;
- Obezbeđenje smisla dobrog rada zaposlenima;
- Obezbeđenje uslova da zaposleni žele da rade;
- Obezbeđenje zaposlenima da se osećaju dobro zato što su dobro radili.

U svim ovim menadžerskim definicijama motivacije i motivisanja uočava se „dobitno - dobitna" kombinacija:

- Ljudi svojim potencijalom (znanjima, sposobnostima, ponašanjem) doprinose ostvarenju ciljeva organizacije;
- Za uzvrat, organizacija im omogućava da ostvarenjem njenih ciljeva, ostvare lične i profesionalne ciljeve (Goleman, 1997; Dil, 1978).

S obzirom da je kvalitet jedan od atributa rada, definicije motivacije za rad primenljive su i na motivaciju za kvalitet. Tako, analogno definiciji motivacije za rad, motivaciju za kvalitet čine faktori koji pokreću, organizuju, usmeravaju i određuju kvalitet radne aktivnosti. Da bi se bolje razumeo pojam motivacije za kvalitet, mora se uzeti u obzir definicija kvaliteta. Pod kvalitetom se podrazumevaju ukupne karakteristike nekog proizvoda, usluge, posla, koje su u stanju da zadovolje

iskazane potrebe kupca, potršača, klijenata, kao i potrebe koje se podrezumevaju (ISO 9000:2000 Sistemi menadžmenta kvlaitetom - Osnove i rečnik). Pri tom, standarde kvaliteta radne aktivnosti postavlja organizacija vodeći računa da njeni proizvodi i/ili usluge zadovoljavaju potrebe proizvođača, kupaca, klijenata. Kavlitet kao cilj organizacije pred zaposlene stavlja maksimalne zahteve, pa shodno datim menadžerskim definicijama motivacije, organizacije koje žele da ostvare kvalitet moraju maksimalno da ulažu u zaposlene i da obzbede uslove za zadovoljavanje njihovih ličnih ciljeva i poreba (Goleman, 1997; Dil, 1978).

Posmatrano u ravni psiholoških saznanja motivacija za kvalitet se zasniva na unutrašnjim motivima, motivu postignuća i potrebi samoaktualizacije. Za aktiviranje ovih motiva potrebno je da prethodne, osnovnije potrebe - egzistencijalne potrebe, potrebe za sigurnošću, društvene potrebe - budu zadovoljene do odgovarajućeg nivoa. Drugim rečima - motivaciji za kvalitet odgovara ambijent u kome vlada atmosfera podrške i podsticajna saradnička klima, a ne ugroženost, strah i nesigurnost. Odnos između motivacije za rad i motivacije za kvalitet je takav da organizacija može do izvesnog stepena da reši problem motivacije za rad (u smislu kvantiteta), a da ne reši problem motivacije za kvalitet. Međutim, ako poblem motivacije za rad nije rešen teško da može biti govora o motivaciji za kvalitet. Naša preduzeća, institucije upravo se nalaze u ovoj drugoj situaciji. To praktično znači da se kod nas pri rešavanju problema motivacije za kvalitet mora poći od rešavanja „klasičnih" problema motivacije za rad.

Motivacija za rad i motivacija za kvalitet uslovljene su nizom međusobno povezanih faktora kao što su:

1. Individualne karakteristike pojedinca - unutrašnji motivi, motiv postignuća, stavovi, potrebe, interesi;
2. Aspiracije, sposobnosti, osobine ličnosti;
3. Karakteristike posla - vrsta posla, stepen samokontrole, odgovornost, autonomnost, složenost rada;
4. Kreativnost;
5. Karakteristike šire radne sredine i ukupne klime u organizaciji - organizacionog ambijenta – rukovođenje;
6. Organizacija, komunikacije, međusobni odnosi;
7. Nivo i karakteristike tehnološkog i ekonomskog razvoja;
8. Društveno - ekonomski odnosi i sistem vrednosti, kultura, religija, geografsko područje.

Inženjer menadžmenta nije u mogućnosti da u istoj meri kontroliše dejstvo svih ovih grupa faktora. On, međutim, mora da ih poznaje i da upravlja onim faktorima koji su pod njegovom ingerencijom. To se pre svega odnosi na individualne karakterisrtike pojedinca, karakteristike posla i karakteristike organizacionog ambijenta. Kvalitet traži celog čoveka, potpunu predanost ostvarenju postavljenih ciljeva i standarda i njihovo stalno preispitivanje i unapređivanje. Kvalitetu teže zaposleni kojima uspešno obavljanje posla samo po sebi predstavlja zadovoljstvo.

Kao što je već gore navedeno, motivacija za kvalitet se, teoriski gledano, zasniva pretežno na unutrašnjim (intrizičnim) faktorima karakterističnim za pojedinca; zatim na motivu samoaktualizacije i motivu postignuća. Kvalitetu teže zaposleni kojima uspešno obavljanje posla samo po sebi predstavlja zadovoljstvo. U osnovi, ova vrsta motivacije se može smatrati određenom strukturom stavova i vrednosti, koja predstavlja opštu radnu, a može se reći i opštu životnu orijentaciju ljudi. To je svojevrsna, stečena i relativno stabilna tendencija ka određenim oblicima ponašanja u ostvarenju opštih i internalizovanih (usvojenih) ciljeva.

Ličnosti sa izraženom unutrašnjom motivacijom, motivom postignuća i potrebom samoaktualizacije imaju sledeće bitne karakteristike:

• Vole situacije u kojima mogu da preuzmu ličnu odgovornost za rešavanje problema;
• Oslanjaju se na lične sposobnosti i zalaganje, a ne na sreću ili nešto drugo;
• Teže da postavljaju umerene ciljeve i preuzimaju rizik, jer aktivnost bez rizika nije izazov, a isto tako preveliki rizik umanjuje šansu da se ostvari cilj.
• Imaju jaku potrebu za povratnim informacijama o postignutom rezultatu.

Iako orgnaizacija realno nije u mogućnosi da zapošljava samo ljude sa visokorazvijenim motivom postignuća i samoaktualizacije, a istina nisu ni svi poslovi u organizaciji pogodni za ispoljavanje ovih

motiva, nije dobro da se pojedinci sa nedostatkom inicijative i samostalnosti nađu na rukovodećim mestima i na kreativnim poslovima, kao i da većina saradnika bude nesamostalna i sa nedovoljno izraženim motivom postignuća.

U većini naših društvenih preduzeća i inicijativa je upravo takav slučaj. Opšta je ocena da su ljudi u društvenim preduzećima nenaviknuti, neobučeni i nemotivisani za samostalan rad. Da li je to zbog toga što se direktor možda nije setio da im da određena ovlašćenja ili jednostavno nemaju dovoljno hrabrosti i smelosti da prihvate odgovornost posla kojim se bave. Mora se pretpostaviti da je to posledica dejstva sistemskih faktora iz ranijih perioda (neselektivnog prijema, neadekvatnog obučavanja, sigurnosti radnog mesta za svakoga, kao i dominacije autokratskog stila rukovođenja, a u velikim sistemima i preterane parcijalizacije rada). Ovo je jedan od najvećih problema koji se mora rešavati u procesu tranzicije. Kavlitet, uz poštovanje standarda traži samostalnost, samoinicijativu od svakog saradnika u granicama omeđenih prirodom posla i ulogom u organizaciji (Grubić, 2004, Vujić, 2003).

Motivacija i selekcija

Inženjer menadžmenta u okviru svoje organizacije mora da utvrdi relevantna svojstva i kriterijume za izbor zaposlenih na osnovu zahteva posla i njegove uloge, a u tome joj veliku pomoć pruža motivacija i selekcija radnika.

Među svojstvima treba da se nađu:

- Osobine ličnosti;
- Motivacija (unutrašnja).

U utvrđivanju svojstava treba da učestvuju:

- Psiholog;
- Stručnjak iz kadrovske funkcije;
- Neposredni rukovodilac;
- Stručnjak, dobar poznavalac posla za koji se bira radnik.

Metod selekcije u domenu motivacije

- Odgovarajući testovi ličnosti i motivacije;
- Intervju.

Ima mišljenja da je traganje za pokazateljima motivacije radnika pri prijemu uzaludan posao, tj. da svi ljudi mogu biti motivisani ako im se obezbedi odgovarajući ambijent. Korisnije je, međutim, poći od teze da se i motivacija "normalno distribuira", što znači da organizacija treba da se „brani" od ekstremno nemotivisanih ljudi za rad. Dobra selekcija, naravno, ne oslobađa menadžment od potrebe za primenom ostalih tehnika upravljanja ljudskim resursima, uključujući i izgradnju odgovarajućeg motivacionog ambijenta.

Neka pitanja za utvrđivanje motivacije pri prijemu novih radnika:

- Šta vas motiviše da uložite više rada? (novac)
- Koja su vaša najveća 2 - 3 uspeha koja su vam pružila zadovoljstvo i zašto?
- Zašto mislite da ćete biti uspešni u ovom poslu?
- Zašto vi smatrate da ste dobri za ova posao?
- Kakav tip rukovodioca iz vas može da izvuče ono najbolje?
- Ispričajte mi nešto o situaciji kada ste imali podršku u poslu?
- Koju najvažniju dobrobit očekujete od svoje karijere?
- Šta po vašem mišljenju određuje uspeh pojedinca u firmi?
- Da li više volite da radite u timu ili samostalno?

Motivacija i obučavanje

Treba imati u vidu da je za uspešno motivisanje važna kvalitetna selekcija prema svim relevantnim kriterijumima, a ne samo prema posedovanju unutrašnje motivacije i motiva postignuća. Čoveka koji po svojim ukupnom sposobnostima, znanjima, veštinama i ostalim karakteristikama ne odgovara zahtevima posla teško je motivisati. Pored selekcije, važno je kasnije stalno obučavanje i obrazovanje. Postoji tesna veza između motivacije i posedovanja znanja, odnosno veština za određene poslove.

Onaj ko ne zna da radi, ili nema iskustva pokazuje po pravilu manje spremnosti (ima negativan stav) i nižu motivaciju i obrnuto - onaj koji ima pozitivan stav prema poslu brže uči i stiče iskustvo. Kod nas se nedovoljno pažnje poklanja i obučavanju i motivisanju. O motivaciji se nešto češće govori pri tom je redak slučaj da se prvenstveno ispita potreba za obučavanjem za rad na novim poslovima, a onda se pristupi motivisanju. U najnovijem standardu ISO 9004:2001, tačka 6. 2. 1 - uključivanje osoblja, prva alineja je - obezbeđenje stalne obuke i planiranje karijere osoblja.

Upravljanje u 21. veku

U proteklih sto godina rad se od serijske proizvodnje na traci transformisao u jedan daleko kreativniji posao, gde su mašine preuzele sve repetitivne, rutinske poslove, omogućavajući ljima da se posvete onim delovima poslovnih procesa koji traže kreativnost, prilagođavanje i inovaciju. U toj novoj ekonomiji glavni zadaci inženjera menadžmenta su takođe potpuno promenjeni. U serijskoj proizvodnji i „staroj ekonomiji" glavni zadaci rukovodilaca bili su uspostavljanje jasno definisanog sistema i poretka, a potom što preciznija kontrola poštovanja tog sistema. U novoj ekonomiji glavni zadatak inženjera menadžmenta je da stalno razvija potencijale svakog zaposlenog i da za izvršavanje svakog novog poslovnog zadatka odabere upravo onu grupu radnika koja će posedovati optimalan skup sposobnosti za izvršenje tog zadatka. Za rukovodioce širom sveta glavni izazov u vremenu je upravo motivacija zaposlenih. Sve drugo se lako kupuje u globalnoj ekonomiji, u kojoj je protok novca apsolutno slobodan. A kao i inače u životu, najvrednije stvari nemaju cenu i ne mogu se kupiti a upravo ljudi prestavljalju najvredniji kapital.

Pitanje motivacije i zapošljavanje novih radnika

Već pri zapošljavanju novih radnika, inženjer menadžmenta vodi računa o tome šta ih motiviše, koliko je to u skladu sa poslovima koje treba da obavljaju i kako će se uklopiti u način poslovanja u preduzeću i odnose koji u preduzeću vladaju. Kako biste to ustanovili, na intervjuu treba postaviti neka od sledećih pitanja:

- U kakvim uslovima i okruženju na radnom mestu mislite da biste bili najproduktivniji i najsrećniji?
- Kakve ste ciljeve postavili sebi? U karijeri i inače u životu?
- Kako biste opisali uspeh u karijeri? Šta je ono što bi trebalo da postignete u karijeri da biste kada pođete u penziju svoju karijeru opisali kao uspešnu?
- Opišite situaciju u kojoj ste motivisali nekog od svojih kolega/prijatelja?
- Zamislite da ste dobili prestižnu nacionalnu nagradu. Za šta biste i u kojim okolnostima tu nagradu mogli da dobijete?

Odgovori koje će kandidati dati na ova pitanja pomoći će vam da izaberete najbolje kandidate za tražene pozicije. Pomoći će vam da nekog ko voli da radi sam i bez uznemiravanja ne zaposlite na poziciju koja zahteva stalnu komunikaciju sa klijentima i kolegama. Ili obrnuto - da nekog ko je izrazito društven i komunikativan zadužite za poslove koji zahtevaju rad u miru i tišini. Uz to, videće se i koje su to vrednosti u koje kandidat veruje i koliko se to podudara sa vrednostima i kulturom koje vladaju u preduzeću.

1. Ciljevi - Inženjer menadžmeta je osoba koja ostvaruje ciljeve uz pomoć ljudi. Mora znati da postavi SMART ciljeve. SMART ciljevi su: specifični, merljivi, izazovni, realni i vremenski ograničeni ciljevi.
2. Liderstvo - Različiti ljudi zahtevaju različit pristup. Lider ocenjuje zaposlene na osnovu spremnosti (znanje+veštine), kao i voljnosti (stav+motivacija). U zavisnosti od zrelosti pojedinca, menadžer primenjuje neki od stilova vođenja.

3. Timski rad - Kreiranje vrhunskog tima podrazumeva: jasan cilj, različite uloge u timu, definisanje pravila, aktivno učestvovanje svih u timu, pažljivo slušanje, međusobno poverenje, veru u uspeh i pozitivan pristup.
4. Motivacija - Ako je zaposleni motivisan, on postiže 40 odsto veću produktivnost. Dobar inženjer menadžmenta postavlja jasan cilj, objašnjava očekivanja, dozvoljava povratnu informaciju, obezbeđuje resurse, nagrađuje i kažnjava pravovremeno, razume potrebe zaposlenog za različitim nagradama, koristi princip pravednosti.
5. Komunikacione veštine - Aktivno slušanje, tehnika otvorenih pitanja, govor tela, parafraziranje su neki od praktičnih alata koje inženjer menadžmenta koristi u svom poslu (Grubić, 2004, Vujić, 2003).

Kada se razmišlja o modelima motivisanja zaposlenih neophodno je uzeti u obzir potrebe i motive zaposlenih, njihova očekivanja, verovanja, vrednosti, ciljeve, rukovodeći se principima razvoja, pravednosti, integrišući u njima moguće i željeno kako bi se što lakše realizovalo. U svom pristupu formulisanja strategija motivisanja zaposlenih neophodno je na najoptimalniji način objediniti teorijske pristupe i koncepte motivacije za rad, osnovne karakteristike ljudske prirode i zahteve samih organizacija.

Bez obzira kojim pristupom u definisanju i objašnjenju motivacije se koristili, motivacija za rad se mora posmatrati kao:

*   proces u ličnosti pojedinca koji je u neprestanoj komunikaciji sa procesima u organizaciji;
*   najneposrednija veza između pojedinca i organizacije;
*   najbliža povezanost između teorije i prakse u menadžmentu;
*   jedan od najznačajnijih pokazatelja organizacione klime i organizacione kulture;
*   mogućnost za razvoj pojedinca i organizacije.

Poslednjih godina se sve češće govori o pristupu motivisanju koje se oslanja na motivacijske teorije potkrepljenja i oblikovanja ponašanja. Otežavajući faktori u koncipiranju samostalnih modela motivisanja zaposlenih u našem društvu se mogu naći u specifičnostima kulture koja je zasnovana na egalitarizmu, gde su pravne regulative neadekvatne, gde je socijalna nesigurnost izražena i gde ne postoje zajednički interesi pojedinca i organizacije. Takođe, loša informisanost zaposlenih o poslovanju i poslovnim rezultatima, kao i nepostojanje komunikacije na različitim nivoima upravljanja, verovanje da ne postiji eksplicitna veza između ljudskih resursa i celokupne poslovne uspešnosti organizacije, umanjuju stepene angažovanja zaposlenih a time i direktno utiču na mogućnosti motivacijskih efekata. Primena modela motivisanja zaposlenih nije moguća u organizacijama koje nisu spremne na promene u razvoj. Spremnost zaposlenih da realno sagledaju situaciju, kako bi se kavko - takvom realnošću borili je jedan od najznačajnijih elemenata u pripremi primene novih motivacionih modela (Grubić, 2004, Vujić, 2003).

Promene u organizaciji, kada je u pitanju čovek je nemoguće izvesti bez promena u motivacionom sistemu, jer on zadire u sistem vrednosti zaposlenih i direktno je povezan sa kompletnim organizacionim ponašanjem. Veoma je teško menjati nešto u orgnizaciji manipulišući podsticajima, premeštajući i menjajući delove ili obučavajući svog kolegu ili grupu. Ono što je potrebno jeste promena našeg mišljenja i sistema vrednosti u organizaciji, našeg opažanja sopstvenog mesta u njoj i zajedničkog funkcionisanja.

U cilju realizovanja sposobnosti, kapaciteta, energije, kreativnosti, privrženosti zaposlenih, i sve to u pravcu obostrane koristi, postoji mogućnost sklapanja takozvanog „Psihološkog ugovora" izmeću zaposlenog i organizacije. To je jedan implicitan ugovor između zaposlenog i organizacije koji specifikuje šta svaka od ugoovrenih strana treba da pruži i da očekuje. Očekivanja su zasnovana na ekspliciranju stavova zaposlenih i opšte važećih pravila organizacije, koji su u cilju povećanja performansi procesa, usaglašavaju. Očekivanja organizacije odnose sa na upotrebu i korišćenje znanja, sposobnosti, iskustva, stavova, razvojnog potencijala, posvećenosti, prihvatanja vrednosti organizacije, dobrih socijalnih odnosa sa ostalim zaposlenima (Grubić, 2004, Vujić, 2003).

Sa aspekta pojedinca očekivanja su usmerena na postojanje mogućnosti za rzavoja i usavršavanje, interesantan rad, priznanja za dobro obavljene poslove, dobru organizaciju posla, sigurnost na poslu i drugo.Upoznavanje organizacije sa očekivanjima organizacije, ali i menadžmenta organizacije sa potrebama i zahtevima zaposlenih je preduslov za stvaranje odnosa poverenja koji je i osnova svih

komunikacija koje imaju uspešnost kao cilj. Poverenje se može posmatrati i kao mera osećaja zajedništva i pripadnosti zaposlenih u jednoj organizaciji. Stvaranje kulture poverenja zasnovano je na stabilnoj emocionalnoj i motivacionoj osnovi zaposlenih i postojanju ličnog primera menadžera.

Motivisane radnike pokreću tri suštinske karakteristike:

1. **Težnja za postignućem**: ljudi sa tom sposobnošću su usmereni prema rezultatima, trude se da ostvare svoje ciljeve i zadovolje svoje kriterijume, postavljaju sebi izazovne ciljeve, spremni su za kontinuirano učenje.
2. **Predanost**: pronalaze osećaj smisla u širem konteksu, spremni su da se žrtvuju za dobrobit organizacije i ovde računa o kkolegama sa posla.
3. **Inicijativa i optimizam**: spremni su da iskoriste priliku, zalažu se za ciljeve koji prevazilaze ono što od njih okružen očekuje, uporno nastavljaju da se kreću prema cilju bez obzira na prepreke, neguju nadu da će uspeti u ostavrenju zamišljenih ciljeva.

Veoma je bitno omogućiti radne uslove koji neće uticati negativno na samo obavljanje posla i koji će u samom poslu podržati autoomiju i odgovornost u radu. Ti radni uslovi bi bili:

- Formulisanje programa pozitivnog potkrepljenja;
- Postojanje mogućnosti za fleksibilno obavljanje posla;
- Usklađivanje zahteva posla sa mogućnostima i očekivanjima zaposlenih;
- Olakšano obavljanje posla sa jasnim zahtevima i analizom tog posla;
- Neprestano informisanje zaposlenih o finansijskim i razvojnim planovima organizacije;
- Stalno učešće u odlučivanju o značajnim segmentima posla;
- Postojanje osećanja sigurnosti;
- Postojanje međusobnog poverenja;
- Razvijanje verovanja u ono što rade;
- Svest o značaju posla koji obavljaju;
- Postojanje zajedničkog cilja;
- Usaglašavanje ličnog cilja sa ciljevima organizacije (Goleman, 1997; Dil, 1978).

Svakako je lično i profesioonalno uvažavanje dobro obavljenog posla glavni pokretač motivacije. Dobijanjem povratne informacijezaposleni uviđaju kakav je kvalitet njihovog rada i mogućnosti napredovanja. Poznavanje rezultata sopstvenog rada predstavlja najveći i najjači motivator za sve zaposlene, pa čak i veći od same novčane naknade, zato što omogućava takmičenje čoveka sa samim sobom a i drugima. Čak je i negativna informacija bolja i korisnija od nepostojanjlja informacija.
Povratna informacija mora biti tačna, pravovremena, iskrena i podsticajna na bolje rezultate. Pored ovih elemenata veoma je važno voditi računa o usklađenosti mogućnosti i interesovanja pojedinca sa zahtevima posla, kao i njegovim očekivanjima koja je uložio u posao koji obavlja kao i omogućiti radne uslove koji neće uticati negativno na samo obavljanje posla. Ličnost zaposlenog zahteva stalnu brigu o razvoju motiva i stavova prema radu (Goleman, 1997; Dil, 1978).

Zaključak

Razvoj motivacije i neprekidno učenje predstavljaju glavne stubove kvaliteta života svakog pojedinca i kao takvi moraju predstavljati jedne od najvažnijih ciljeva svake organizacije. Kažu ljudi da je čovek onoliko mlad, vitalan i uspešan koliko je spreman da uči, koliko je spreman da se menja zahvaljujući učenju, zahvaljujući tome što učenje donosi znanje radi umenja, znanje radi čovekove biti. Većina uspešnih ljudi se slaže u tome da znanje nije znanje ako nije u funkciji. Treba znati kako učiti, kako birati potrebno znanje, kako praviti prioritete, kako donositi odluke, kako poštovati sebe pa i druge i kako stečeno zanje primeniti.

Čovek se ne može osloboditi svojih prenaglašenih želja time što će ih potisnuti, niti time što će ih ostvariti. U oba slučaja one postaju sve nametljivije, neodoljivije, nerazumnije, opsesivnije. Postoji samo jedna mogućnost oslobađanja a to je unutrašnji rad.

Učiti, sticati nova znanja, primenjivati ih, doprinositi populaciji je ključ uspeha. Uspeh je odraz paradigmi, on je putovanje a ne destinacija, način na koji se krećemo od onoga gde jesmo - zatečeno ka onome što želimo - željeno. Uspeh može biti navika ako se jednostavno, bez komplikovanja, na bazi

jasne vizije cilja, korak po korak, prelazi svaki put. Ljudi jako lako stiču navike kako negativne tako i pozitivne a još lakše ih se pridržavaju. Biti negativan je navika, biti pozitivan je takođe navika. Treba samo odabrati šta se želi biti.

Nemanje ciljeva i neshvatanje njihove važnosti, strah od promena, negativne emocije, samoopravdavanja, izgovori, preterana zabrinutost ili preosetljivost, prebacivanje odgovornosti na druge, sve su to razlozi koji dovode do neuspeha. Jer čovek se fiksira za svoje ciljeve pozitivnim emocijama. Najveća snaga čoveka se ogleda u tome koliko je spreman da prihvati odgovornost za svoje ciljeve, ponašanja, posledice i da time izbegne stvaranje negativnih emocija. U tome se ogleda velika vrednost inženjera menadžmenta.

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Inženjering održivog razvoja u Rumuniji

Marius Calin Benea[1], **Maria Laura Benea**[2]

[1]Politehnica University Timișoara, Faculty of Engineering Hunedoara, str. Revoluției, Nr.5, Hunedoara, Romania, marius.benea@fih.upt.ro
[2]Politehnica University Timișoara, Faculty of Engineering Hunedoara, str. Revoluției, Nr.5, Hunedoara, Romania, laura.benea@fih.upt.ro

Apstrakt: Ekonomija je samo jezgro razvojne ćelije. Svako zdravo društvo želi prosperitet. Model koji Rumunija dugo traži mora da dolazi iz sledećih kriterijuma: prosperitet za zemlju, stanje razvoja kritične mase stanovništva i niži nivo siromaštva. Istovremeno, treba razmotriti mogućnost postojanja normalne, pristojne države za one kojima je potrebna socijalna pomoć. Ako Rumunija želi da ima širu perspektivu, onda je pogodnija za održivi razvoj. O ovom modelu Rumunija treba da razmišlja, jer joj je to potrebno.

Ključne reči: Rumunija, ekonomski model, održivi razvoj.

Engineering Sustainable Development in Romania

Abstract: Economics is just the core of a development cell. Every healthy society wants prosperity. The model that Romania has been looking for a long time has to come from the following criteria: prosperity for the country, a state of development for a critical mass of the population and a lower level of poverty. At the same time, the possibility of having a normal, decent state for those in need of social assistance should be considered. If Romania wants to have a wider perspective, then it is better suited for sustainable development. It is at this model that Romania should think of, because it needs it.

Keywords: Romania, economic model, sustainable development.

1. INTRODUCTION

Romania recorded economic growth in 2008, but at the end of the last quarter of that year it entered the crisis. Poland was the only country in the European Union that was not in crisis in 2009. In 2016, when Romania advanced to the dawn of recovery, it was the first to grow in the EU. It is still the country with the highest economic growth, but fails to ensure a healthy, sustainable growth.

Romania is now number seventh in the EU at the number of inhabitants with a resident population of 19.5 million, which does not take into account another three to four million living abroad. Instead, Romania is the seventeenth country in the EU after GDP with 186 billion euros. The growth model that Romania is looking for throughout the world is found ... in its own history. In 1913, Romania ranked eleventh in Europe from 19 countries analysed.

2. THE STATE OF ROMANIA

Romania achieved an economic growth of 8.5% in 2008, the highest rate of economic growth in the European Union that year, but in the fourth quarter the country had already entered the crisis. In the first year of decline in 2009, Romania had a significant economic decrease of 7.1%. The largest economic downturns in the EU in that year were: Lithuania (-14.8%), Estonia (-14.7%) and Latvia (14.3%). On the opposite side, the lowest negative developments were: Cyprus (-2%), Belgium (-2.3%), Malta (-2.5%) and Portugal (-3%). Romania recovered slightly in 2010, when the economic growth began.

In 2015 Romania had an economic growth of 3.5%, in 2016 an evolution of 4.8% (the country with the highest growth rate in the EU) in 2017 (5.7% in the first quarter and 5, 9% in the second quarter), almost double the EU average.

By population size, Romania is seventh in the EU with 19.5 million inhabitants according to official data, plus three to four million Romanians abroad. On the contrary, according to Gross Domestic Product, Romania is ranked 17th in the EU, with 186.5 billion euros in 2016. Our GDP is very small. On the scale of the truth, we are on the 27th place with 17,500 euros per capita, according to Eurostat. This problem of GDP per inhabitant is one of the most important problems to be solved for Romania.

There are ten EU countries with smaller populations than Romania, but with higher GDP. One of the most striking examples is Ireland, which has a GDP of 307 billion euros to 4.6 million people [1].

3. LESSONS FROM OUR OWN HISTORY

The model we are still looking for throughout the world is found in our own history. Since 1990, the top Romanian politicians are still looking for a development model. There was talk about the Swedish, the German, and then the Japanese one. None of these models had any points in accordance with the specific situation in Romania. But if we go back in 1913, we might find a solution. Here we refer to the book "This Time Is Different: Eight Centuries of Financial Folly" written by Carmen Reinhart and Kenneth Rogoff [2]. The two researchers sought the most powerful economies on every continent. In 1913, they selected 19 countries from Europe, of which Romania ranked 11th, followed by Turkey, Sweden, Hungary, Denmark, Greece, Portugal, Finland and Norway.

How was that result made? What did Romania do to get there? What kind of Romania did that result have? How did Romania recover in 54 years, from 1859 to 1913, three centuries of return? Interesting is the "Cuza Report on the State of the Nation," in December 1859, at the end of the first year of the union that said we had everything to create. Following the "creation" of public credit, the leu in 1867, the National Bank of Romania (the 16th bank in the world even before the FED), in 1880, road openings (such as railways, roughly the same time as the United Kingdom and with US, bridges) etc. How have they been done? By organizing the work, organizing the finance, and building an internal change program. In addition, at that time, for the first time in an official document in Romania, the word restructuring appeared - on May 10th, 1866, in the oath passed by Carol I as the ruler of Romania. Since May 10th, 1866, we are still pronouncing this word, but restructuring has not yet begun. In addition, at that time, the institutions were extremely powerful. One of them was the Public Ministry, which was led by some of the most powerful people at the time - Ion I.C. Bătianu, his son Ionel Bratianu, Manolescu, Saligny. They have made some constructions that make the fairer of Romania today, because we have nothing to blame for what we have done. This climate could not have been developed without good schools. The emphasis on school was very strong at that time. If we had everything to create and made public credit, we also made a system to convey, for a critical mass, the common sense of money. And today, we would need to implement the common sense at the level of the country's population.

What does the model we want mean, because the optimal one does cannot be reached so easily? It means wise laws, powerful and efficient institutions, and performant teams. This is the model that, if today, we manage to implement, but we are still far away. For example, there are 16,000 confusing and interpretable laws in Romania. As long as we have those, we will not be able to go forward. According to an EU study of 2016 on financial education, Romania has ranked last of the 28 EU countries. Education is a key condition of this model that we need 10 years from the beginning of the crisis [3].

4. EDUCATION - A KEY FACTOR IN THE SUSTAINABLE DEVELOPMENT PROCESS

The concept of sustainable development must be implemented at the level of the whole society, the role of education - in general - and of higher education - in particular - being decisive. First, universities need to become sustainable, in order to reach a sustainable society. At the level of university education, sustainable development refers to the management of specific processes and activities, by increasing the quality of services provided by representative institutions (state and private universities). Finally, these will be translated into well-trained graduates to meet the real needs of the labour market.

4.1. What does a sustainable university mean?

An important attempt to define what "sustainable university" means was made in 1990 by the Talloires Declaration. Jean Mayer, president of Tufts University, Boston convened 22 rectors in Talloires, France to express their concerns about the state of the world and to create/draw up a document identifying key actions that universities must do for a sustainable future [4].

4.2. How would a sustainable higher education institution look like?

An academic institution dedicated to sustainability would help students understand the origin of environmental degradation and motivate them to discover environmentally sustainable practices, while teaching them the origin of contemporary injustice in contravention with what justice is meant to be and the human nature in theory.

4.3. Sustainable development in the university curriculum

The role of higher education in the context of sustainable development:

- Educating students by helping them acquire knowledge about the complex interactions between economics and social and environmental factors;
- Identifying technical and social solutions to the challenges posed by sustainable development;
- Assume the position of catalyst for learning about the sustainable development, beyond the barriers of higher education, by exchanging ideas and ideas with local communities, the business environment, government and other authorities, and the broader world.

4.4. Barriers to incorporating sustainable development into the curriculum and implementation solutions

The experience of foreign universities shows that the number of identified obstacles is different depending on the specifics of faculties and curricula.

It is often argued that the failure to incorporate sustainable development into the curriculum is due to the "mismatch" of the concept with the field / study specialization, lack of staff experience, financial restrictions, limitations of education legislation, or internal regulations.

Exploring the experience of universities in developed countries highlights four major barriers to a successful implementation of education for sustainable development:
1. agglomerated or over-agglomerated curriculum;
2. irrelevance perceived by academic staff;
3. limited knowledge and expertise of the personnel;
4. the leadership of the institution and the limited dedication of the staff.

Universities that have encountered problems in enhancing sustainable development in the curriculum have identified a number of solutions to overcome the barriers described in the table below:

Table 1. Barriers and Solutions

BARRIERS	SOLUTIONS
Crowded curriculum	Creating "space" in curricula by rigorously analyzing existing curricula or redefining them by reconsidering the skills required for each university qualification.
Irrelevance perceived by academic staff	Developing credible teaching materials that are fully contextualized and relevant to each field/specialization
Limited knowledge and expertise of staff	Significant investments in staff development and building the capacity to adapt.
Institutionally limited dedication	Develop new motivation policies and explain possible benefits.
	Revise and modify the institution's institutional mission and policy

It is of great importance to inform and improve the staff. Workshops are particularly useful for staff to discuss the concept of sustainable development of society (and implicitly about the sustainability of higher education). This concept must be approached from a dual perspective, cultural and scientific.

4.5. The experience of students in a sustainable university

Universities must ensure the optimal conditions that allow students to develop their values, skills and thinking to contribute to sustainable development.

In this respect, a good example of the implementation of the concept of sustainable development should be offered to students.

"Providing a good example is not the main way to influence others, but is the only method" (Albert Einstein).

5. CONCLUSIONS

Romania in 2017 is growing economically but needs sustainable development. Our own history teaches us that we have had a model that allowed us to recover in the back of 54 years 3 centuries of return: by organizing labor, finances, and building an internal change program.
This climate could not be developed without good schools, which would allow the implementation of the common sense at the level of the country's population. Unfortunately Romania ranks last in the EU in this chapter.

The concept of sustainable development must be implemented at the level of the whole society, the role of education - in general - and of higher education - in particular - being decisive. This is done by: educating students by helping them acquire knowledge about the complex interaction between economic, social and environmental factors; identifying technical and social solutions to the challenges posed by sustainable development; assuming the position of catalyst for learning about sustainable development beyond the barriers to higher education.

For Romania, sustainable development is not one of the possible options, but the only prospect.

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Društveni inženjering *Open Source* softvera

Dejan Viduka[5], Ana Bašić[2], Vladimir Kraguljac[3]

[1] SPESCOM-Consulting d.o.o., Novi Sad, dejan@viduka.info
[2] SPESCOM-Consulting d.o.o., Novi Sad
[3] Fakultet za hotelijerstvo i turizam u Vrnjačkoj Banji, Univerzitet u Kragujevcu

Apstrakt: Cilj ovog rada je da se definiše pravac razvoja softvera otvorenog koda (*Open Source Software*). Analizom postojećih informacija o softverima otvorenog koda izvedeni su zaključci kolika je perspektiva ovog razvojnog koncepta. U okviru rada analizirani su poznati primeri iz prakse, kao i tendencije velikih kompanija prema Open Source softverskom razvoju. Postojeće tendencije analizirane su sa aspekta koji utiču na popularizaciju i primenu Open Source softvera, kao što su: bezbednost, dostupnost, ušteda i softverska nezavisnost. Posebna pažnja posvećena je pregledu pozitivnog pravnog primera Bugarske koja je već napravila prve korake na putu ka implementaciji Open Source softvera u zakonsku regulativu. Na kraju rada utvrđen je pravac razvoja koncepta softvera otvorenog koda. Posebno je istaknut potencijal ovog koncepta, kao i potencijal softvera koji su razvijeni primenom njegovih pravila.

Ključne reči: Open Source, GNU/Linux, Microsoft, vlasnički softver i softveri otvorenog koda.

Social Engineering of *Open Source* Software

Abstract: The goal of this paper is to determine the direction of development of open source software. By analyzing the existing information about open source software, conclusions were drawn about the perspectives of this development concept. As part of the paper, known examples from the practice were analyzed as well as the tendencies of large companies towards open source software development. Existing tendencies have been analyzed for aspects that affect the popularization and application of open source software, such as security, availability, savings and software independence. Special attention has been paid to the review of Bulgaria's positive legal case that made the first steps in the way of implementing open source in legal regulation. At the end of the work, the direction of the development of the concept of open source software was determined. The potential of this concept as well as the software developed with the application of the rules of this concept has been highlighted.

Keywords: Open Source, GNU/Linux, Microsoft, Commercial software i Open Source softwere.

1. Uvod

U poslednjoj deceniji došlo je do naglog prodora infomatike u sve sfere društva. Ova pojava dovela je do brzog razvoja novih softvera koje korisnici upotrebljavaju u svakodnevnom radu. Istovremeno su nastala dva koncepta razvoja novih softvera. Sa jedne strane razvio se Open Source koncept, dok se sa druge strane razvio tzv. vlasnički softver na čelu sa kompanijama Microsoft i Apple, svetski poznatim igračima u sferi informacionih tehnologija. Glavni nosilac Open Source softvera je GNU/Linux i sve njegove distribucije. Za razliku od vlasničkog softvera, distribucije Open Source softvera su uglavnom besplatne, a samim tim i lako dostupne korisnicima. Uz Apache server, neki od softvera koji se u velikoj meri upotrebljavaju u korporativnom svetu su i: Perl, Sendmail, GNU i Linux (Haruvy i sar, 2003). Koncept otvorenog koda (Open Source) je veoma upotrebljiv i ima velike mogućnosti primene i unapređenja. Upotreba otvorenih standarda i Open Source softvera (OSS) predstavlja sredstvo pomoću koga može da se smanji rizik zaključavanja, poboljša interoperabilnost i da se stimulišu inovacije (Gamalielsson i sar, 2015). Mnogi stručnjaci već godinama pokušavaju da ospore neke od vrednosti softvera otvorenog koda, dok sa druge strane ima i onih koji u sve većem broju pristupaju zajednicama programera i ljubitelja ovog koncepta.

Predmet istraživanja predstavlja rešavanje pitanja da li je bitka između konkurenata završna tj. da li svi zajedničkim snagama idu ka boljem i sigurnijem razvoju novog softvera ili je po sredi nešto sasvim drugo što se krije iza kulisa. Kako kaže Gary Anthes, "Novi projekti danas podrazumevaju otvorene izvore, osim ako postoji dobar razlog zašto ih ne bi trebalo koristiti. To je potpuni prelaz sa vlasničkog softvera i mišljenja koje je vladalo u ranijim vremenima" (Anthes, 2016).

2. Analiza poznatih tendencija i primeri upotrebe Open Source softvera u svetu

Poslednjih par godina u velikom broju država pokrenut je postupak racionalizacije i uštede koji se ostvaruje prelaskom na Open Source softver. U nastavku rada prikazani su najpoznatiji primeri prelaska na softvere otvorenog koda, kako zbog uštede, tako i zbog softverske nezavisnosti i sigurnosti.

U literaturi se najčešće navodi primer grada Minhena koji je 2003. godine započeo prelazak na Linux sisteme i to čak na 14.000 računara. Izabrana je Debian distribucija Linux-a, a pomoću nje je razvijen sistem baziran na Linux-u pod imenom LiMux.

Evropska zajednica finansira "JoinUp" projekt koji ima za cilj da olakša saradnju i smanji troškove administrativnih službi državnih uprava, kako unutar pojedinih država, tako i među članicama Evropske unije, bazirano na slobodnom softveru (Viduka, 2012).

Ruski premijer je krajem 2010. godine potpisao nalog u kome poziva sve agencije Savezne vlade da pređu sa komercijalnog softvera na besplatne softverske alternative. Najveća promena, koja se očekuje je prelazak vladinih institucija na GNU/Linux operativne sisteme, a namera je da se ovaj plan sprovede u celosti. Ovaj nalog obuhvata sve državne agencije i sve organizacije koje su finansirane iz državnog budžeta. Takav potez će biti veliki udarac za Microsoft čiji operativni sistem Windows je korišćen već decenijama kao standardni proizvod u većini velikih državnih preduzeća i vlada širom sveta. Premijer Rusije takođe je zahtevao da se GNU/Linux kao operativni sistem postavi i na svim serverima. Ova odluka je veoma dobra što potvrđuje i podatak Netcraft-a o tome da najbolje svetske firme koje se bave web servisima svoj rad zasnivaju upravo na ovom softveru. Iako je sad već 2018. godina još uvek nema potvrde da je ovaj proces okončan, što ostavlja prostor za raspravu o isplativosti prelaska i sličnim aktuelnim temama o kojima se već godinama raspravlja.

Sličnim smerom, na putu implementacije softvera otvorenog koda, kreću se i američke kompanije, univerziteti, vladine institucije, državne i republičke agencije. Navedene institucije sve više prihvataju profesionalni Google Docs kao alternativu Microsoft-ovom Office paketu.

Među prvim državama koje su implementirale softver otvorenog koda bila je i Španija, tj. njena pokrajna Valensija. Valensija je za devet godina prebacila ukupno 110.000 računara na GNU/Linux distribuciju pod imenom "LliureX" koja je zasnovana na "Edubuntu" Linux distrubuciji. Oni su ovu promenu uveli u svoj školski sistem i uspeli da uštede 36 miliona evra. Na ovaj način pokazali su i drugima da uspešno može da se radi na Open Source softverima i da se istovremeno ostvari zanačajna ušteda novca.

U italijanskoj regiji Umbrija izračunali su da imaju prevelike izdatke za plaćanje softverskih licenci za Microsoft-ov kancelarijski (MS Office) paket. Za te troškove Umbrija je trebalo da izdvoji 284.490 evra, ali proračuni su pokazali da će migracija na LibreOffice (LibreUmbria) na nekoliko stotina računara koštati samo 56.000 evra. Na ovaj način bila bi ostvarena značajna ušteda.

Sredinom 2013. godine francuska vlada donela je odluku da besplatni softver ima prioritet u obrazovanju. Francuska političarka Fleur Pellerin, delegat Ministarstva za malo i srednje preduzetništvo, takođe se zalaže za uvođenje slobodnog softvera, jer smatra da bi slobodan softver mogao da podstakne razvoj preduzetništva i time da osigura softversku nezavisnost Francuske.

Pored prednosti koje primena Open Source softvera donosi u obrazovanju i drugim institucijama u vidu ušteda i razvoja poslovanja, Velika Britanija napravila je još jedan korak. Vlada Velike Britanije donela je odluku o prelasku na dokumenta otvorenog formata, kako bi svojim građanima omogućila da sami izaberu programe u kojima će kreirati i čitati dokumenta.

Koliko je značajna upotreba slobodnih softvera, kako sa ekonomskog aspekta, tako i sa aspekta kvaliteta i bezbednosti upotrebe, govori i činjenica da je upotreba Open Source softvera zastupljena i u mnogim državnim institucijama.

Najnoviji primer odluke o primeni Open Source softvera dolazi iz Bugarske (2016). Kako kaže Bozhidar Bozhanov, savetnik zamenika bugarskog premijera, bugarska vlada uspela je da u novi akt o elektronskoj upravi postavi Open Source kao standardni i obavezni oblik softvera, koji se nabavlja ili piše za vladine ustanove. Kasnije je planirano da se napravi i javni repozitorijum, što će u velikoj meri da smanji troškove mnogim vladinim institucijama, kao i da obezbedi veću sigurnost softvera kroz transparentnost koda. Ovaj primer predstavlja dobar model za mnoge države zato što je u Bugarskoj prioritet upotrebe ovog softvera zakonski regulisan.

Iz dosadašnjeg pregleda, očigledno je da mnoge zemlje postepeno uvode primenu softvera otvorenog koda u neke sektore, makar i u obliku pilot projekata. Najveći pomak, u pravnom smislu, za primenu i razvoj Open Source projekata učinila je bugarska vlada. Na taj način ostvarena je je softverska nezavisnost, kao i velika pomoć raznim IKT start-up-ovima koji sada mogu da razvijaju svoje softvere na ovim tehnologijama, a da primenom zadatih standarda budu konkurentni na tržištu.

Mnogi su pokušavali da ospore mogućnost da Linux parira Windows-u na polju desktop računara. Često se pominje da će grad Minhen da se vrati Windows-u zato što se Linux nije pokazao kao dobro rešenje kako se očekivalo kada su prelazili na njega. Pretpostavlja se da će im za povratak na Windows trebati 100 miliona evra.

Početkom 2018. godine Internetom je odjeknula vest da je španski grad Barselona posle probnog perioda i testiranja na 1000 računara, odlučio da 70% svog budžeta za softver posveti Open Source projektima i da kompletno pređe na GNU/Linux Ubuntu. Koliko je ovo pametan potez i do kavih su zaključaka oni došli na pilot projektu od 1000 računara, trenutno nije nigde objavljeno. Logično je da je ova odluka doneta iz razloga ostvarenja višestruke dobiti. Ostaje nepoznato da li je motiv prelaska na softver otvorenog koda samo finasnijski ili ima još neke aspekte koji su samo njima poznati?

3. Diskusija rezultata istraživanja

Svi navedeni primeri dati u okviru ovog rada dobro su poznati svima koji prate ovu temu. Novi momenat donosi odluka glavnog rivala, kompanije Microsoft, da u svoju verziju popularnog operativnog sistema Windows 10 implementira Linux Ubuntu radno okruženje. Ovo su mnogi ljubitelji otvorenog koda jedva dočekali. Međutim, ova vest pokrenula je pitanje kuda se kreće Open Source pokret i šta komapanija Microsoft pokušava ovim potezom. Pored ovog primera ima još par dobro poznatih softverskih paketa koji koriste programeri. NET je jedan od softvera koje je Microsoft prilagodio skoro svim poznatim platformama i objavljen je kao Open Source. Iz ovog se vidi da Microsoft polako pravi postepenu tranziciju ka pokretu otvorenog koda. Naravno, ovde nije stvar samo o prednostima, nego i o privlačenju ili osvajanju dela tržišta koje u sve većem broju počinje da upotrebljava neke od softvera otvorenog koda.

Još jedan od primera ove tržišne bitke između dva rivala su serverske platforme, kao i cloud rešenja koja sve više osvajaju tržište i polako postaju glavani cilj u razvoju. Upravo je Linux jedan od lidera na polju serverske primene, pa samim tim veliki konkurent i za osvajanje velikog tržišnog kolača na polju cloud tehnologija. Kako ovo nije samo mišljenje autora i ostalih zaljubljenika u softvere otvortenog koda, Microsoft još jednim potezom potvrđuje da Open Source ima budućnost. Krajem 2016. godine, na konferenciji u San Francisku, Microsoft je objavio da postaje premium član Linux fondacije. Ovo je definitivno potvrda da Linux, pa samim tim i Open Source, imaju svoju svetlu budućnost.

Novi trendovi razvoja nametnuli su u prvi plan još jedan Open Source projekat. Radi se o GitHab repozitorijumu koji je okupio veliki broj programera i firmi među kojima je i kompanija Microsoft. Ovakvih primera ima mnogo i u skorijoj budućnosti može se očekivati veća integracija ovih sistema, a samim tim i brži razvoj nove tehnologije.

4. Doprinos ovog rada

U okviru ovog rada analiziran je razvoj softvera otvorenog koda, kao i njegove primene u mnogim zemljama. Rad doprinosi povećanju svesti o prednostima koje donosi upotreba Open Source softvera. Sveobuhvatnim pregledom mnogih prednosti koje imaju zemlje koje su uspešno primenile Open Source softver gradi se model koji mogu da primene menadžeri i informatičari koji do sada nisu pratili ovu temu. Ovaj rad im upravo osvetljava pravac po kome bi trebalo da usmere svoje poslovanje i prikazuje način na koji mogu da ostvare dobit primenom Open Source softvera.

Prikazani koncept softverskog razvoja mnogima može da donese velike prednosti, kako sa pravnog, ekonomskog, hardverskog, socijalnog, obrazovnog i mnogih drugih aspekata.

5. Zaključak

Analiza predmeta istaživanja ovog rada zahteva mnogo informacija na osnovu kojih bi mogli da se izvedu odgovarajući zaključci. Veoma često nedostatak informacija u ovoj oblasti predstavlja veliki problem. Zbog toga smo osuđeni da problem sagledavamo na osnovu dostupnih informacija i da na osnovu njih sudimo kakva je budućnost softvera otvorenog koda i u kom pravcu se kreće njegov razvoj kao i njegova konkurencija.

Podaci navedeni u okviru ovog rada ukazuju da je mnogo urađeno u primeni Open Source softvera u raznim institucijama. Očigledno je da veliki informatički igrači traže svoje mesto kao i deo tržišnog kolača koji trenutno pripada Open Source softverima. Još je rano da se utvrdi da li je GNU/Linux odgovarajuća zamena za Microsoft-ov Windows na desktop računarima, ali je istina da je na odličnom putu i da je u svakom pogledu pogodan kao alternativa u mnogim delatnostima. Pored toga ne treba o Open Source softverima suditi samo na osnovu Linux-a. Linux je jedan od istaknutijih predstavnika i mnogima je dobro poznat, ali treba razmatrati i mnoge druge softvere koji su objavljeni pod licencama otvorenog koda i onda na osnovu njih donositi zaključke. Verujemo da su svi navedeni primeri realni i da su ogledna testiranja pokazala da je GNU/Linux dostojna zamena uz odgovarajući budžet. U narednom periodu možemo očekivati da se mnogo veći broj ozbiljnih država, institucija i firmi odluče za prelazak na softvere otvorenog koda.

Open Source pokret i njegovi derivati imaju svetlu budućnost, a koliko je ta budućnost blistava pokazaće vreme i iskustva korisnika. Ono što je sigurno je da bi trebalo pokušati sa primenom Open Source softvera na malim test serijama i na osnovu dobijenih rezultata donositi zaključke. Veoma je važno da se obrazovne institucije uključe u proces implementacije Open Source softvera tako što će formirati stručni kadar koji će biti u mogućnosti da razvija i softvere otvorenog koda.

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Modeling potencijala pojedinaca i timova - Toyota

Sérgio Caldeirinha[1]

[1]LEAN Academy Portugal, sergio.caldeirinha@lean.org.pt

Apstrakt: Kompanija Toyota je u stanju da iznenadi hiljade stručnjaka širom sveta. Ključno pitanje koje se postavlja je kako je Toyota zadržala i još uvek drži fokus tokom decenija kontinuiranog razvoja i poboljšanja svog poznatog svetskog TPS-a? Da bi bolje razumeli potrebno je znati kako Toyota regrutuje, kako izgrađuje sposobnosti i kako angažuje zaposlene. Toyota koristi formulu za procenu potencijala pojedinaca i potencijala tima. Toyota koristi DOJO, prostore za učenje, u fabrikama, na tzv. gembi, za obučavanje radnika. To su replike stvarnih proizvodnih linija i radne sredine, gde se, na primer, svi novozaposleni obučavaju mesec dana, sa praktičnim i teorijskim procesima evaluacije. Kao zaključak može se reći da su njihovi ljudi njihova najveća imovina.

Ključne reči: Toyota, timovi, potencijal zaposlenih, potencijal timova.

Toyota Individual and Team Potential Modeling

Abstract: Toyota Company that is able to puzzle thousands of thinkers around the world. The key question is how did Toyota keep and still keeps its focus throughout decades of continuous development and improvement of their world known TPS? To understand it better it is necessary to know how Toyota recruits, how they build capabilities, and how they engage employees. Toyota uses a formula to evaluate each one's potential and the team's potential. Toyota uses DOJOs, learning areas within the plants, at the *gemba*, to train workers. Those are replicas of the real work lines and work context, where, for instance, all the new hires train for a full month, with practical and theoretical evaluation moments. As a conclusion one's can say that their people are their biggest asset.

Keywords: Toyota, individual potential, team potential.

1. Introduction

On Sunday, the 24th of September was the final day of a study trip to Toyota Motor City, to celebrate the 10th birthday of the Lean Global Network (LGN). The purpose was to learn about this dazzling Toyota Company that is able to puzzle thousands of thinkers around the world. Those ten days, that were about to end, were prepared in detail, individually and collectively, from LGN Headquartes in Boston, with the Lean Enterprise Institute taking the lead months earlier, in front of those 40 lean thinkers coming from more than 20 different countries around the world. Later on the trip, the group was named as the *United Nations of Lean*. A well deserved *nick name* for such awesome group of persons.

2. Toyota Individual and Team Potential Model

Month before, each one went through the key questions to address throughout this weeklong journey. That was THE moment, to put in write what each one wanted to bring back from this huge moment, where the group would be among the best lean thinkers and doers on earth.

Finding answers direct from the source, the TPS (Toyota Production System) experts, the ones with 30 plus years of career around Lean Thinking, Lean Management and Lean Learning. Those were the ones that could validate our questions and support conclusive answers.

And *Learning* was the verb the group pursued. How did Toyota keep and still keeps its focus throughout decades of continuous development and improvement of their world known TPS? This was the question. In particular, get to know how Toyota recruits, how they build capabilities, and how they engage employees.

Partially, some of the answers were found. Here are some of the learnings brought from Japan:

1. Toyota uses a formula to evaluate each one's potential and the team's potential. While the first variable below is, kind of given by your nature and live experiences, the last couple are hard worked throughout the working journey, while Toyota employee:

$$Output = \alpha \times [\Sigma i\ (Personality) \times (Ability\&Skills) \times (Motivation)]$$

α= Team cooperation degree

2. New hires come from a wide range of sources, naming a few: Toyota Technological Institute (www.toyota-ti.ac.jp), Partnerships with Nanzan University & Aichi University, able to teach and graduate for a range of needs, from MSc to Ph.D degrees. The real difference comes when you take a close look at the Courses configuration and the Learning dynamics. They're set to create change agents, an army of Thinkers and skilled Doers.

3. Then there was something big in purpose. But indeed simple and obvious. Something never saw at any of the European OEMs: The Skills DOJO. DOJO is a term to define a 'place of learning & training', just like the ones used for martial arts. The Toyota DOJOs are learning areas within the plants, at the *gemba*, to train workers. Those are replicas of the real work lines and work context, where, for instance, all the new hires train for a full month, with practical and theoretical evaluation moments. Those are part of a more complete set of the capability building scheme, but in fact, one astonishing piece. There were several of these: Logistics at Oguchi Service Parts Centre; Welding, Assembly and Painting at Takahama Plant, were some of the few seen.

Figure 1. Scheme (Source: https://photos.app.goo.gl/QyXCjinBFVJxAsyz2)

4. The scheme above is performed over and over and we all listened from Mr. Horikiri Toshio, that: "… you need to let workers DO, provide them with positive FEEDBACK, give them EXPOSURE, so they fell pleasure and be willing to REPEAT it". Great learning from such basic thinking. Or as Mr. Sadao Nomura, a senior expert on TPS said, TPS is all about "…*how to make money",* through basic thinking, basic principles and basic processes.

Conclusion

As a conclusion one's can say that Toyota really knows how to do it. Their people are their biggest asset and they know it. People are Toyota's straight path to sustainable, continuous and perpetual improvement.

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

Title of Paper in Serbian

Authors' Name and Surname[1]*, Name and Surname[2], Name and Surname[3] [in this stage leave it empty for the peer review purpose]

[1] Institution and E-mail address [in this stage leave it empty for the peer review purpose]
[2] Institution and E-mail address [in this stage leave it empty for the peer review purpose]
[3] Institution and E-mail address [in this stage leave it empty for the peer review purpose]

Summary in Serbian: This document is a template for formatting the papers in order to prepare them for printing. This summary provides briefly the information related to the content of the article so that the reader can rapidly and accurately assess its relevance. Authors should explain the goals of research or state the reason (reasons) why they have written the article. Then, it is necessary to describe the methods used in the study and briefly describe the results they have obtained in the research. The abstract should be between 100 and 250 words long.

Keywords: 3-5 keywords for indexing and search purposes

Title of Paper in English

Abstract in English: This document presents a template for preparing the print-ready papers that will be included in the Serbian Journal of Engineering Management. The abstract briefly summarizes the article and gives the reader the opportunity to assess its relevance. 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 long.

Keywords: 3-5 keywords for indexing and search purposes

1. Introduction

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.

2. Structure of the paper

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.

Numbered subtitles of the first level must be formatted using the font 12 pt bold, a second-level sub-titles should be 10 pt bold. The text, and a list of references should be formatted using the font 10 pt.

3. Graphs, tables and formulae

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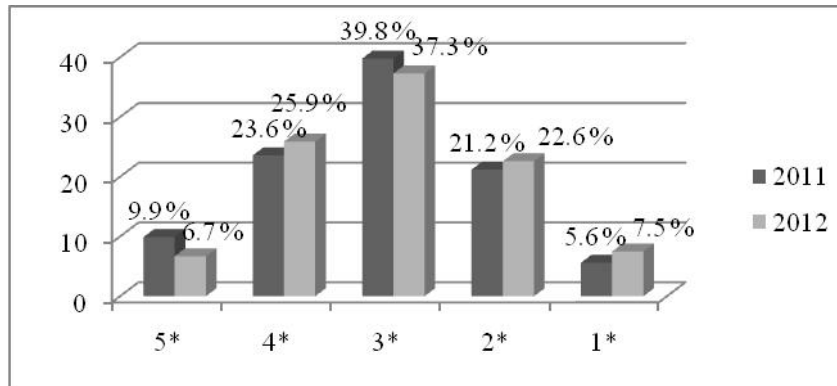
Source: (The Ministry of Finance and Economy, 2013)

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)

Submit your article, including tables, images, etc., as a single file. In addition, you should submit all figures and tables (which are entered in black and white) as separate files in TIFF or JPF format with a minimum resolution of 300dpi.

Formulae should be centered on the page and properly numbered, as in the following example. It is recommended that you format the rows with formulae in Microsoft Word (using MathType).

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

4. Conclusion

In conclusion, the authors should summarize the results they have obtained in the research.

5. Literature

When quoting the literature, the APA referencing system should be used. For more information, see the Publication Manual of the American Psychological Association (6th ed.).

When quoting within the text, as in the sentence where you mention the author and specify his words, then after the author's name you should indicate the year of publication of the quoted text in parentheses, at the end of the sentence there should be the number of page in which the text should be indicated: according to Čerović (2012) „quoted text''(p.10). When the author is not mentioned in the sentence, then his last name, the year of publication and the number of page should be indicated in parentheses at the end of a sentence, and if the quote was created by paraphrasing or summarizing, then data about the page number is not required: (Čerović, 2012). If there are two or more references by the same author, but they were published at the same time in the same year, the referencing should look like this (Harish, 2008a; Harish, 2008b). When two authors wrote the paper together, the surnames of both authors are written as follows (Petković and Pindžo, 2012), or (Tew & Barbieri, 2012). The call for references in the text requires working with more than two authors and should be stated as follows (Luque-Martinez et al., 2007). When citing a source that does not show the number of pages (such as electronic sources) use the author's name and year of publication if the author is known, and if the author is a corporation or an organization, write down the organization name and year of publication (Ministry of Finance and Economy, 2013).

References should be given at the end of the main text in alphabetical order, following the last name of the author. Below are shown examples of using APA style for citations appearing in various forms (books, journal articles, proceedings, electronic resources, etc.).

A book with one author:
Example: Hrabovski, Tomić, E. (2009). *Health tourism destinations.* Novi Sad: Prometheus.

A book with several authors:
When you have multiple authors, all of them are supposed to be mentioned, but as soon as the last surnames are added and if there are more than seven authors, mention the first six and then write … at the end of the last author.

Example: Barrows, C. & W. Powers, T. (2009). *Introduction to the Hospitality Industry.* 7th edition. Hoboken, New Jersey: John Wiley & Sons, Inc.

A book which was translated from a foreign language:
Example: Spic, E. H. (2011). *Art and psyche: a study of psychoanalysis and aesthetics.* (A. Niksic, prev.). Belgrade: Clio.

A book with an editor for a collection of papers; proceedings:
If the book is a collection of papers on the appropriate topic, the authors should mention the editor of their work with the surname and first initial in parentheses as they add "edit" if the person is editor, or "Ed." as editor if the book is written in a foreign language.

Example: Đurković, M. (ed.) (2007). *Serbia 2000-2006: state, society, economy, Belgrade:* Institute for European Studies.

Papers in the proceedings:
Example: Cerovic, S. (2012). *Modern concepts of strategic tourism destination management.* Scientific conference with international participation "Tourism: Challenges and Opportunities", Trebinje.

Papers published in the journal by one author:
Example: Harish, R. (2008). Brand Architecture and its Application in Strategic Marketing. *The Icfai University Journal of Brand Management,* 7 (2), 39-51.

Papers in a journal with two authors:
If the article to which you refer has a DOI number, references need to be added.

Example: Tew, C. Barbieri, C. (2012). The perceived benefits of agritourism: The provider's perspective. *Tourism Management*, 33 (6), 215-224. doi: 10.1016 / j.tourman.2011.02.005

Papers in a journal with more than two authors:
Example: Luque-Martinez, T. Castaneda-Garcia, A. J., Frias-Jamilena, D. M., Munoz-Leiva, F. & Rodriguez-Molina, M. A. (2007). Determinants of the Use of the Internet as a Tourist Information Source. *The Service Industries Journal*, 27 (7), 881 to 891. doi: 10.1080 / 02642060701570586

Newspaper article with the aforementioned author:
Example: Muscle, M. (days 1 February 2012). US Steel has reduced its losses. *Politika,* p. 11

Newspaper article with no author specified:
Example: Straževica ready in two months. (Days 1 February 2012). *Politika,* p. 10

Thesis in the printed version:
Example: Dewstow, R. A. (2006). *Using the Internet to enhance teaching at the University of Waikato* (Unpublished master's thesis). University of Waikato, Hamilton, New Zealand.

Document or database from the Internet, the private or official web page for which we know the database author:
Example: Kraizer, S. (2012). Safe child. Retrieved on 29 October 2012, from http://www.safechild.org/

Document or databases from the Internet, the official web page for which we do not know the author:
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Document or databases from the Internet, private or official web page where the author is a corporation or organization:
For example, the Ministry of Finance and Economy. (2013). Information on tourist traffic in Serbia. Retrieved on 06 February 2013 from http://www.turizam.mfp.gov.rs/index.php/sr/2010- 02-11-17-24-30

The sources which were not used in the paper should not be included in the list of references. References should be cited in the language in which they are published without translating them into the language of paper.

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

Naslov rada na srpskom jeziku

Ime Prezime[6]*, Ime Prezime[2], Ime Prezime[3] [ostavite u ovoj verziji prazno za potrebe recenzije]

[1] Institucija i i-mejl adresa [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 abstact 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

1. Uvod

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.**

2. Struktura rada

U prvom redu na prvoj strani treba napisati naslov rada na srpskom jeziku (16 pt). Ispod naslova rada treba ostaviti mesto za navođenje ime(na) autora, nazive institucija autora onako kako je naznačeno u ovom Obrascu. Nakon institucije poslednjeg autora, ostaviti jedan prazan red i u sledećem napisati kratak sažetak (10 pt). Nakon sažetka sledi pregled ključnih reči. Nakon prikazanog naslova rada, sažetka i ključnih reči na srpskom jeziku, potrebno je i na engleskom jeziku naznačiti prethodno navedeno.

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
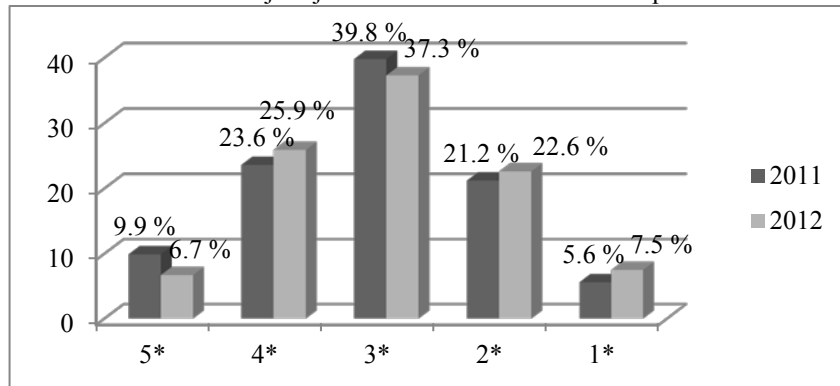
Izvor: (Ministarstvo finansija i privrede, 2013)

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).

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

4. Zaključak

U zaključku autori treba da sumiraju rezultate do kojih su došli u istraživanju.

Literatura

Prilikom navođenja literature, treba se pridržavati uputstva APA sistema navođenja literature. Za više informacija pogledajte *Publication Manual of the American Psychological Association* (6th ed.).

Prilikom citiranja unutar teksta, kada u rečenici spominjete autora i navodite njegove reči, onda posle imena autora treba navesti godinu izdanja citiranog teksta u zagradi, a na kraju rečenice potrebno

je navesti broj strane na kojoj se nalazi rečenica u tekstu iz koga navodite: prema Čeroviću (2012), „citirani tekst" (str.10). Kada se autor ne spominje u rečenici onda njegovo prezime, godinu izdanja rada i broj strane u radu navesti u zagradi i na kraj rečenice, a ako je citat nastao parafraziranjem ili rezimiranjem, onda podatak o broju strane nije neophodan: (Čerović, 2012). Ukoliko se navodi dve ili više referenci istog autora, a pri tom su objavljene u istoj godini, poziv na reference treba navesti na sledeći način (Harish, 2008a; Harish, 2008b). Kada su dva autora rada, navode se prezimena oba autora na sledeći način (Petković i Pindžo, 2012), odnosno (Tew & Barbieri, 2012). Poziv na reference u tekstu za radove sa više od dva autora treba navesti na sledeći način (Luque-Martinez i sar., 2007). Kada citirate izvor koji ne prikazuje broj strana (kao što su elektronski izvori) koristite prezime autora i godinu objavljivanja, ukoliko je autor poznat, a ukoliko je autor korporacija ili organizacija, naziv organizacije i godinu objavljivanja (Ministarstvo finansija i privrede, 2013).

Reference treba navesti zajedno na kraju glavnog teksta azbučnim redom po prezimenu autora. U nastavku su prikazani primeri korišćenja APA stila za citiranje u raznim oblicima pojavljivanja (knjiga, rad u časopisu, zbornik, elektronski izvori itd.).

Knjiga sa jednim autorom:
Primer: Hrabovski, Tomić, E. (2009). *Destinacije zdravstvenog turizma.* Novi Sad: Prometej.

Knjiga sa više autora:
Kada imamo više autora navodimo ih sve, s tim što pre poslednjeg prezimena dodajemo i, odnosno &, ako imamo više od sedam autora, navodimo prvih šest, zatim pišemo pišemo tri tačke, i na kraju poslednjeg autora.

Primer: Barrows, C. W. & Powers, T. (2009). *Introduction to the Hospitality Industry.* 7th edition. Hoboken, New Jersey: John Wiley&Sons, Inc.

Knjiga, prevod dela:
Primer: Spic, E. H. (2011). *Umetnost i psiha: studija o psihoanalizi i estetici.* (A. Nikšić, prev.). Beograd: Clio.

Knjiga sa urednikom ili priređivačem, zbornik radova:
Ako je knjiga zbornik radova na neku odgovarajuću temu, kao autora navodimo priređivača tog dela i uz njegovo prezime i inicijal imena u zagradi dodajemo "ured." ako je urednik, ili "prir." ako je priređivač, ili pak "Ed." kao editor ako je knjiga pisana na stranom jeziku.

Primer: Đurković, M. (ured.) (2007). *Srbija 2000-2006: država, društvo, privreda, Beograd:* Institut za evropske studije.

Rad u zborniku radova:
Primer: Čerović, S. (2012). *Savremeni koncepti strategijskog upravljanja turističkom destinacijom.* Naučni skup sa međunarodnim učešćem "Turizam: izazovi i mogućnosti", Trebinje.

Rad u časopisu sa jednim autorom:
Primer: Harish, R. (2008). Brand Architecture and its Application in Strategic Marketing. *The Icfai University Journal of Brand Management,* 7(2), 39-51.

Rad u časopisu sa dva autora:
Ako članak na koji se pozivate ima DOI broj, treba ga dodati referenci.

Primer: Tew, C. & Barbieri, C. (2012). The perceived benefits of agritourism: The provider's perspective. *Tourism Management,* 33(6), 215-224. doi:10.1016/j.tourman.2011.02.005

Rad u časopisu sa više od dva autora:
Primer: Luque-Martinez, T., Castaneda-Garcia, J. A., Frias-Jamilena, D. M., Munoz-Leiva, F. & Rodriguez-Molina, M. A. (2007). Determinants of the Use of the Internet as a Tourist Information Source. *The Service Industries Journal,* 27(7), 881-891. doi: 10.1080/02642060701570586

Članak iz novina sa navedenim autorom:

Primer: Mišić, M. (1. feb. 2012). Ju-es stil smanjio gubitke. *Politika,* str. 11.

Članak iz novina bez navedenog autora:
Primer: Straževica gotova za dva meseca. (1. feb. 2012). *Politika,* str. 10.

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