

INFORMATION TECHNOLOGY AS AN INDICATOR OF THE LEVEL OF ORGANIZATIONAL PERFORMANCE

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This paper presents the results of research into the impact of information technology (IT) on individual and organizational performances in companies in Serbia: job satisfaction (JS), communication satisfaction (CS), organizational commitment (OCM), organizational trust (ITW), organizational learning (OL) and financial performance (FP). The data were obtained from a questionnaire completed by N = 380 middle managers from 102 companies in Serbia. The methods used for statistical data processing were: descriptive statistics, correlation analysis and the t-test. The main conclusions of the study are: 1. Information technology items in companies in Serbia are slightly above average values. 2. The level of information technology in the company is an indicator of the level of organizational performance in the company. 3. The level of information technology in the company has direct and indirect positive impacts on the level of a number of organizational performances in the company.

Keywords: Information technologies; Organizational performances; T-test; Serbia.

INTRODUCTION

Information technologies have become an important part of everyday life. They have improved the exchange of knowledge and accelerated the flow of information and communication. Their influence on human life, both professionally and personally, is undeniable, and the continuous development of information technology is constantly setting new challenges for people to improve, learn and adapt. In addition, the commercial use of computers has significantly changed the organization and the way they operate. Globalization and the need to achieve competitiveness on the market represent an additional obligation, which may also be an aggravating factor for companies, particularly in

transition countries such as Serbia. For example, during the transition in Slovakia, information technology was seen as an accelerator of necessary changes in the business sector (Kokles et al., 2015).

Information and communication technologies are of particular importance in developing countries (Roztocki & Weistroffer, 2015). At the same time, these authors point out that the core of research in this area is focused on a small number of highly developed countries, which certainly does not give a complete and sufficient picture of the real situation. Soja and Cunha (2015) state that countries in transition are an example of less developed countries and they make up about a third of the total world population. Consequently,

the role of transition countries is becoming increasingly important in the global economy, which is why these countries deserve more attention from researchers. According to (Stanimirović & Vintar, 2015), the application of information technologies and systems must take into account the socio-economic characteristics and national specifics of individual countries. This indirectly indicates the connection between information technology and various aspects of organizational behavior, at all levels (individual, group and organizational).

According to Hu and Kapucu (2016), the level of use of information technology of the organization should correspond to the organizational goals, mission of the company, structure and capacity of the company, as well as the role of the company in communication and coordination with other companies. The application of information technology in the work process has contributed to mixing the boundaries between work and private life (Wright et al., 2014). Some employees consider information technology a suitable means of connecting with work in the home environment, which is why their job satisfaction is higher. A similar result is shown by the research (Taboroši et al., 2020), in which, among other things, it was shown that remote employees, in general, show stronger organizational commitment and trust at work than conventional employees. All this indicates that the application of information technologies needs to be approached in an optimal way.

Numerous studies point to the importance of user satisfaction with information technology, as even the satisfaction of users of information technology is considered as a surrogate of performance in information technology (Delone & McLean, 1992). According to McMurtrey, Grover, Teng and Lightner (2002), information technology has a greater influence on the job satisfaction of employees with dominant technical professional orientation, than on those with managerial orientation. The research results gained by Danziger and Dunkle (2004) show that as the work performed by employees is based more on computer work, their job satisfaction decreases. Also, job satisfaction increases with a sense of autonomy at work, and declines with increasing hours of work on the computer. The research results of Maroofi, Rastad and Amjadi (2015) show that information technology does not have a direct impact on job satisfaction, unless the company has a high level of

orientation towards technology. In addition, their results also indicate that administrative skills simplify the effects of information and communication technologies on employee job satisfaction.

Communication plays an important role in the organization, and information technology significantly affects the communication within an organization. Akkirman and Harris (2005) investigated the levels of satisfaction with communication among employees working in a virtual operating environment, and those in a traditional working environment. The results, opposite to the hypothesis, showed that employees in a virtual working environment have a higher level of satisfaction with communication. White, Vanc and Stafford (2010) explored how employees in large companies observe communication. Employees feel that communication by e-mail is an efficient way of sharing information, but direct interaction is still the best accepted and this is true for employees at all levels. The authors conclude that, if carefully used, electronic communication can successfully replace traditional methods of communication in an organization.

Also, it is important to consider the concept of trust in cases that are different from traditional ones. On the one hand, trust can be seen from the perspective of trust in information technology. This means that it depends on the willingness of an individual to rely on technology instead of trying to control it (McKnight, 2005). On the other hand, confidence can be seen as mutual trust, in new conditions, affected by the use of information technology, which is the angle of observation in this paper. The research results gained by Ashleigh and Nandhakumar (2002) indicate that team members need personal contact and direct interaction in order to develop trust. Also, trust in team members decreases with the increasing degree of isolation.

Nonaka, Umemoto and Senoo (1996) investigated the impact of information technology on the implementation of the concept of an organization that creates knowledge. The authors concluded that any company wishing prosperity should seek synergy of information technology and people, with a common ability to create knowledge. Dimovski and Škerlavaj (2004) found that an extremely turbulent business environment requires rapid adaptation and acceptance of change. In order to achieve this, the organizational study is of

crucial importance. The research conducted by Poór, Sasvári, Szalay, Petó, Gyurián, Suhajda and Zsigri (2020) points out the significance and effects of e-learning, as well as the need for wider application of e-learning in companies.

Numerous researchers have studied the impact of information technology on a company's financial performance. Studies during the 1980s failed to find a link, so this situation is called the paradox of production. It soon turned out that investments in information technology contributed to higher growth in productivity, and the results were visible at the level of organizations and at country level (Dedrick et al., 2003). In this way, the positive impact of information technology on financial performance was confirmed. The results of another survey demonstrated that companies with a higher quality of information technologies have better financial performance (Bharadwaj, 2000).

This paper examines the impact of different control variables (gender of the CEO, age of the CEO, ownership structure of company and financial performance of company) on information technology in companies, and, also, the impact of information technology on the dimensions of job satisfaction, communication satisfaction, organizational commitment, mutual trust at work, organizational learning and financial performance of companies in Serbia. From the foregoing considerations, it is clear that this kind of research is of great significance, particularly because no similar studies have been carried out in Serbia.

THEORY AND RESEARCH QUESTIONS

Contemporary business and information technologies

Changes in the environment are becoming a common reality modern organizations are facing. In order for all these changes to be successfully monitored, it is necessary for organizations to be agile, and the agility of the organization can be effectively provided by digital strategies and the development of IT resources (Dragičević & Bošnjak, 2019). Digital transformation in companies creates conditions for creating new values for users, employees, but also companies, which, in this way, become more competitive and better positioned in the market (Vidas-Bubanja et al. 2019). Digital transformation is achieved with the education of employees, but

also with the support of the government and state institutions.

Recently, special attention has been paid to Industry 4.0, which is based on the implementation and application of information and communication technologies (ICT). According to Bakator, Đorđević and Čočkaló (2019), globalization and the fourth industrial revolution – Industry 4.0, bring challenges for SMEs. Thus, the presence on the international market requires the application of adequate quality management system, the application of ICT and the modern manufacturing equipment. Also, the application of Industry 4.0 technologies and the lean startup approach has a significant role in developing the theoretical entrepreneurship model for overcoming barriers and challenges faced by young entrepreneurs in Serbia (Bakator et al., 2018).

In this way, information technologies have become an important strategic resource for organizations. They provide the gathering of information important for good decision-making (Galbraith, 2012). The use of information technology was the key of improving organizational performance (Devaraj & Kohli, 2003). Managers should be aware of the importance of acceptance of information technology by employees, and that this is the way to realize the benefits of information technology, but also an overall improvement in organizational performance.

Organizational performance and information technologies

According to Spector (1997), job satisfaction is a person's evaluation of his (or her) job and work context, i.e. an attitude reflecting how well people like or dislike their job. A high level of job satisfaction affects increase in performance, commitment to the organization, and at the same time, reduces absenteeism and organization abandonment (Cohrs et al., 2006). According to McCormick and Ilgen (1985), job satisfaction is an association of positions of the members of an organization and refers to the general attitude of an individual in relation to his work.

Job satisfaction is most certainly connected to information technologies (IT). Using satisfaction spillover theory, Wang, Wang, Zhang and Ma (2020) showed that IT satisfaction positively influences employees' job satisfaction. As a result, managers need to pay special attention to IT in the

workplace, as well as to improve employee experiences with using IT. According to Castellacci and Viñas-Bardolet (2019), Internet technologies for professional purposes, in general case, enhance job satisfaction by improving access to data and information, creating new activities, and facilitating communication and social interactions. It should be borne in mind here that there is an additional effect of the type of occupation and the level of education on the observed relationships. The research conducted by Zivnuska, Carlson, Carlson, Harris, Harris and Valle (2020) has shown that ICT incivility aggression has an adverse effect on workplace events, job satisfaction, but also on family relationships. As a result, we should definitely strive to reduce the effect of these harmful phenomena. Information and communication technologies (ICT) also do have effects on educational processes. Thus, certain variables of ICT, for example: perceived digital self-efficacy for teaching, perceived institutional support for innovation, teachers' attitudes towards ICT, have an impact on teachers' efficiency, motivation, work engagement and satisfaction (Moreira-Fontán et al., 2019).

According to Downs and Hazen (1977), communication satisfaction is defined as the attitude of employees in relation to various aspects of communication. Redding (1972) used the term communication satisfaction to indicate the overall level of satisfaction that employees experience in their communication environment. Pace and Faules (1994) indicate that satisfaction with communication represents individual affective reactions to the desired outcome arising from the communication that occurs within an organization.

The link between the application of information and communication technology (ICT) and communication satisfaction has been confirmed in different areas of ICT use. For example, the research conducted in China (Zhen et al., 2019), showed that the use of ICT platforms or devices, in the work of public administrations, certainly contributes to increased satisfaction in the communication by the service users. Furthermore, the application of ICT among older users leads to the perception of increased satisfaction in social and emotional needs, greater satisfaction in communication and greater satisfaction in performing daily activities (Blok et al., 2020). Also, the application of ICT among young children leads to strengthening of academic and non-

academic skills, improves verbal communication, quality of group work and group communication, as well as the degree of motivation and satisfaction of children (Roldán-Álvarez et al., 2020).

Organizational learning is the capacity of an organization to be competitive (Argote, 2013). Dibella, Edwin, Nevis and Gould (1996) argue that organizational learning increases the development of existing skills or develops new ones. Cook and Yanow (1993) considered it necessary to seek the attributes by which organizations can meaningfully understand, possess and use knowledge, because organizational learning is not an essential cognitive activity. At a minimum, organizations do not have the typical means of knowledge.

Recent research reveals that organizational learning and knowledge management are influenced by informational technologies. According to Tortorella, MacCawley Vergara, Garza-Reyes and Sawhney (2020), learning capabilities at an organization level positively mediate the impact of I 4.0 on higher operational performance. In this way, the positive impact of informational technologies on organizational learning has been indirectly confirmed. Research in China (Xue et al., 2021) has shown that there is a growing influence of relationship learning (based on organizational relationships) on the technological innovation of organizations, support for the development of artificial intelligence (AI) technology, as well as faster information exchange. Research in the Spanish chemical industry (Céspedes-Lorente et al., 2019) indicates the potential that IT can have on organizations in improving knowledge management, innovation management and organizational learning, especially in the conditions of downsizing. Dominguez Gonzalez and Massarolide Melo (2018), showed on the example of 234 companies in the automotive industry that factors such as: human resources management, supportive leadership, learning culture, autonomy and systems of information technology (IT), influence the knowledge exploration and exploitation process.

The previous statements show that it is justified to investigate the place and importance of information technology in business, both in terms of impact of certain control variables on information technology in the organization, and in terms of effects of information technology on individual and organizational performances. The research presented in this paper is of an

exploratory nature and it is difficult to set up hypotheses in advance. Therefore, the following research questions were set up:

- RQ1: Does the gender of the CEO affect information technology in companies?
RQ2: Does the age of the CEO affect information technology in companies?
RQ3: Does the ownership structure of the company (state owned or privately owned) affect information technology in companies?
RQ4: Does the financial performance of a company affect information technology in companies?
RQ5: Can the level of information technology (high or low) within a company be an indicator of the level of organizational performance?

METHOD

Survey instruments (measures)

In this study, questions to measure information technology were established on the basis of theoretical considerations and relevant aspects of the observation of information technology. Thus, many references indicate the importance of the application of information technology (Bajkiewicz et al., 2011; Schultz, 2011). In addition, there are a number of studies which explore the importance of the training and motivation of employees to work with modern information technologies (Keller & Staelin, 1987; Iselin, 1993). To all this is added the issue related to the importance that the management of a company places on information technology. Thus, for the purposes of this study, six questions were defined that represent the state of information technology within a company: IT1 - Possession of modern IT; IT2 - Using (application of) modern IT; IT3 - Use from modern IT; IT4 - Training of employees to work with modern IT; IT5 - Motivation of employees to work with modern IT; IT6 - The importance that management places on modern IT. All six questions provide an opportunity to reply with a 5-point Likert scale.

Employee job satisfaction is measured by Spector's (1985) questionnaire for measuring job satisfaction (JSS). The JSS has 36 items that are evaluated by marks ranging from 1 to 6. The items are grouped into nine dimensions that assess the attitudes of employees to their job and to certain aspects of their job. For measuring communication satisfaction, the Communication Satisfaction

Questionnaire (CSQ) by the authors Downs and Hazen (1977) was used as an instrument. The Communication Satisfaction Questionnaire consists of 40 items covering eight dimensions. In this research 35 items and seven dimensions from the CSQ were used (Table 1). The responses were measured using a 7-point Likert scale.

Cook and Wall (1980) developed an instrument that measures organizational commitment. The instrument has 9 items and three dimensions. The responses were evaluated by marks 1-5, where 1 denotes strongly disagree, and 5 completely agree. The Interpersonal trust at work instrument (Cook & Wall, 1980) has 12 items and four dimensions. The responses were evaluated by using a 7-point Likert scale.

In order to measure organizational learning a shorter version of the Dimensions of Learning Organization Questionnaire (DLOQ) by the authors Marsick and Watkins (2003) was applied. The questionnaire has 21 items and 7 dimensions. The responses were evaluated by marks 1-6, where 1 denotes strongly disagree, and 6 fully agree.

Financial performances were selected from references that examine the following items: profitability, sales growth, asset growth, market share, and competitive status in the firm's industry (Tan & Litschert, 1994; Wang et al., 2003; Wang, Tsui & Xin 2011). Besides them, two more items were added: productivity and salaries. In this way, seven financial performances were formed, which were examined in this study. All seven performances are evaluated based on five-point Likert scales. Financial performances, in this paper, are considered one dimension, which comprises these seven items.

Participants and data collection

The research was carried out in Serbian companies. The survey was conducted by the respondents (middle management) completing the questionnaire. The survey was conducted using interviews with the respondents. A total of N = 380 middle managers from 102 companies completed the questionnaire.

Given that this is an empirical study with human participants, it is important to emphasize that participation in the research was voluntary and anonymous, as well as that the obtained data and results were used exclusively for scientific

purposes. The anonymity of completing the questionnaire implies both the anonymity of individual respondents and the anonymity of the companies in which the respondents are employed.

In this way, the ethics of the research is ensured, that is, the ethical aspects of the research are fulfilled.

Table 1: Descriptive statistics

| | Abbr. | N | Min | Max | Mean | Std. Deviation | α |
|--|-------|-----|------|------|--------|----------------|----------|
| Possession of modern IT | IT1 | 380 | 1 | 5 | 3.45 | 1.169 | |
| Using (application) of modern IT | IT2 | 380 | 1 | 5 | 3.51 | 1.236 | |
| Use from modern IT | IT3 | 380 | 1 | 5 | 3.47 | 1.227 | |
| Training of the employees to work with modern IT | IT4 | 380 | 1 | 5 | 3.39 | 1.196 | |
| Motivation of the employees to work with modern IT | IT5 | 380 | 1 | 5 | 3.49 | 1.181 | |
| The importance that management gives to modern IT | IT6 | 380 | 1 | 5 | 3.57 | 1.195 | |
| Information technologies (dimension) | IT | 380 | 1.00 | 5.00 | 3.4785 | 1.02743 | .927 |
| Pay | JS1 | 380 | 1.00 | 6.00 | 4.1954 | 1.09123 | .749 |
| Promotion | JS2 | 380 | 1.00 | 6.00 | 4.2489 | 1.12466 | .790 |
| Supervision | JS3 | 380 | 1.00 | 6.00 | 4.4013 | 1.06615 | .764 |
| Fringe Benefits | JS4 | 380 | 1.00 | 6.00 | 4.2257 | 1.16438 | .793 |
| Contingent Rewards | JS5 | 380 | 1.00 | 6.00 | 4.2638 | 1.17372 | .791 |
| Operating Procedures | JS6 | 380 | 1.00 | 6.00 | 4.3421 | 1.10456 | .753 |
| Coworkers | JS7 | 380 | 1.25 | 6.00 | 4.4086 | 1.06610 | .763 |
| Nature of Work | JS8 | 380 | 1.00 | 6.00 | 4.3599 | 1.04575 | .764 |
| Communication | JS9 | 380 | 1.00 | 6.00 | 4.3151 | 1.05998 | .771 |
| Organizational perspective | CS1 | 380 | 1.00 | 7.00 | 4.9389 | 1.24831 | .843 |
| Communication with supervisors | CS2 | 380 | 1.20 | 7.00 | 5.1121 | 1.12986 | .842 |
| Communication climate | CS3 | 380 | 1.00 | 7.00 | 4.8084 | 1.36164 | .873 |
| Personal feedback | CS4 | 380 | 1.60 | 7.00 | 5.0653 | 1.31897 | .869 |
| Horizontal and informal commun. | CS5 | 380 | 1.20 | 7.00 | 5.2258 | 1.00996 | .707 |
| Media quality | CS6 | 380 | 1.20 | 7.00 | 5.0632 | 1.17197 | .817 |
| Organizational integration | CS7 | 380 | 1.20 | 7.00 | 5.2137 | 1.02970 | .730 |
| Organizational identification | OCM1 | 380 | 1.00 | 5.00 | 3.6360 | .88072 | .796 |
| Organizational involvement | OCM2 | 380 | 1.33 | 5.00 | 3.5684 | .94452 | .806 |
| Organizational loyalty | OCM3 | 380 | 1.00 | 5.00 | 3.5439 | .88745 | .796 |
| Faith in intentions of Peers | ITW1 | 380 | 1.00 | 7.00 | 5.5667 | 1.22968 | .845 |
| Faith in intentions of Management | ITW2 | 380 | 1.00 | 7.00 | 5.6614 | 1.18896 | .757 |
| Confidence in actions of Peers | ITW3 | 380 | 1.00 | 7.00 | 5.7342 | 1.19431 | .823 |
| Confidence in actions of Management | ITW4 | 380 | 1.00 | 7.00 | 5.5789 | 1.28219 | .863 |
| Create continuous learning opportunities | OL1 | 380 | 1.00 | 6.00 | 4.5070 | 1.03314 | .850 |
| Promote inquiry and dialogue | OL2 | 380 | 1.00 | 6.00 | 4.5904 | 1.08764 | .880 |
| Encourage collaboration and team learning | OL3 | 380 | 1.00 | 6.00 | 4.1956 | 1.14861 | .906 |
| Create systems to capture and share learning | OL4 | 380 | 1.00 | 6.00 | 4.0912 | 1.37698 | .918 |
| Empower people toward a collective vision | OL5 | 380 | 1.00 | 6.00 | 3.9693 | 1.35013 | .916 |
| Connect the organization to it environment | OL6 | 380 | 1.00 | 6.00 | 4.0395 | 1.35467 | .912 |
| Provide strategic leadership for learning | OL7 | 380 | 1.00 | 6.00 | 4.0544 | 1.39584 | .932 |
| Financial performance | FP | 380 | 1.00 | 5.00 | 3.5511 | .76824 | .897 |

RESULTS

The results presented in this paper were obtained within the research (Mitić, 2016).

Descriptive statistics

Table 1 shows the descriptive statistics for the items and dimensions for the observed questionnaire: information technology (IT), job satisfaction (JS), communication satisfaction (CS),

organizational commitment (OCM), organizational trust (ITW), organizational learning (OL) and financial performance (FP).

Within the descriptive statistics the average grades for the information technologies items and information technologies dimension are given, depending on the gender of the CEO, the age of the CEO, the ownership structure of the company and financial performance. The results of the descriptive statistics are given in Table 2. For

financial performance, the financial performance dimension consisting of seven items was analysed. The sample of N = 380 respondents was divided (by the median) in half, into those with a low financial performance dimension (Low FP) and those with a high one (High FP). Thus, both groups have 190 respondents. Within both situations (Low FP and High FP), the average values were calculated for the information technologies items and information technologies dimension.

Table 2: Average values for information technologies, according to different criteria

| | Mean Totally | Gender of CEO | | Age of CEO | | The Ownership Structure of the Company | | Financial Performance | |
|-----|-----------------|---------------|--------|------------|--------|--|------------------|--------------------------|--------|
| | | M | F | Younger | Older | State Owned | Private Owned | Low | High |
| N | 380 | 341 | 39 | 279 | 101 | 240 | 140 | 190 | 190 |
| IT1 | 3.45 | 3.43 | 3.59 | 3.44 | 3.47 | 3.27 | 3.75 | 3.17 | 3.74 |
| IT2 | 3.51 | 3.48 | 3.82 | 3.54 | 3.44 | 3.38 | 3.75 | 3.19 | 3.81 |
| IT3 | 3.47 | 3.45 | 3.59 | 3.49 | 3.39 | 3.33 | 3.70 | 3.17 | 3.76 |
| IT4 | 3.39 | 3.37 | 3.51 | 3.41 | 3.32 | 3.22 | 3.66 | 3.11 | 3.63 |
| IT5 | 3.49 | 3.48 | 3.56 | 3.54 | 3.37 | 3.32 | 3.79 | 3.21 | 3.75 |
| IT6 | 3.57 | 3.55 | 3.67 | 3.59 | 3.50 | 3.37 | 3.91 | 3.19 | 3.93 |
| IT | 3.4785 | 3.4619 | 3.6239 | 3.5030 | 3.4109 | 3.3146 | 3.7595 | 3.1833 | 3.7737 |

Correlation analysis

Table 3 shows the correlation between the analysed information technologies items. These results refer to the total sample of N = 380 respondents. Pearson correlation was used. All the correlations are statistically significant, and $**p < 0.01$.

Table 3: Pearson coefficients of correlation between information technologies items ($*p < 0.05$; $**p < 0.01$)

| | IT1 | IT2 | IT3 | IT4 | IT5 | IT6 |
|-----|-----|--------|--------|--------|--------|--------|
| IT1 | - | .768** | .655** | .606** | .545** | .578** |
| IT2 | | - | .799** | .678** | .607** | .623** |
| IT3 | | | - | .785** | .646** | .639** |
| IT4 | | | | - | .800** | .666** |
| IT5 | | | | | - | .772** |
| IT6 | | | | | | - |

T-test

The analysis was done for the information technologies dimension. The sample of N = 380 respondents was divided (by the median) in half into those with low IT (Low IT) and those with high IT (High IT). Thus, both groups have 190 respondents. Within both situations (Low IT and High IT), the average values of the observed variables: job satisfaction (JS), communication satisfaction (CS), organizational commitment (OCM), organizational trust (ITW), organizational learning (OL) and financial performance (FP) were calculated. The results of these calculations are given in Table 4. After that, the t-test was done for the average scores of the observed variables in those two situations (Low IT and High IT). The average scores for which there are significant differences between the groups of data are marked in Table 4 (the bold values). It may be noted that in all cases there is a statistically significant difference in the average score of the observed variables to the high and low values of the IT dimension.

Table 4: T-test over the average scores of observed variables, for Low IT and High IT

| | IT | N | Mean | Std. Deviation | Std. Error Mean | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
|------|------|-----|---------------|----------------|-----------------|---|------|------------------------------|---------|----------------|--------------|-------------------|
| | | | | | | F | Sig. | t | df | Sig. (2-tail.) | Mean Differ. | Std. Err. Differ. |
| JS1 | Low | 190 | 3.8895 | 1.10268 | .08000 | 3.162 | .076 | -5.686 | 378 | .000 | -.61184 | .10760 |
| | High | 190 | 4.5013 | .99186 | .07196 | | | -5.686 | 373.838 | .000 | -.61184 | .10760 |
| JS2 | Low | 190 | 3.9026 | 1.15172 | .08355 | 7.267 | .007 | -6.301 | 378 | .000 | -.69254 | .10991 |
| | High | 190 | 4.5952 | .98432 | .07141 | | | -6.301 | 369.044 | .000 | -.69254 | .10991 |
| JS3 | Low | 190 | 4.0171 | 1.10286 | .08001 | 10.223 | .002 | -7.523 | 378 | .000 | -.76842 | .10215 |
| | High | 190 | 4.7855 | .87536 | .06351 | | | -7.523 | 359.476 | .000 | -.76842 | .10215 |
| JS4 | Low | 190 | 3.8724 | 1.15948 | .08412 | 3.877 | .050 | -6.200 | 378 | .000 | -.70658 | .11397 |
| | High | 190 | 4.5789 | 1.05989 | .07689 | | | -6.200 | 374.991 | .000 | -.70658 | .11397 |
| JS5 | Low | 190 | 3.8908 | 1.18002 | .08561 | 5.296 | .022 | -6.527 | 378 | .000 | -.74605 | .11431 |
| | High | 190 | 4.6368 | 1.04418 | .07575 | | | -6.527 | 372.484 | .000 | -.74605 | .11431 |
| JS6 | Low | 190 | 4.0605 | 1.16764 | .08471 | 9.626 | .002 | -5.133 | 378 | .000 | -.56316 | .10972 |
| | High | 190 | 4.6237 | .96113 | .06973 | | | -5.133 | 364.533 | .000 | -.56316 | .10972 |
| JS7 | Low | 190 | 4.0842 | 1.10680 | .08030 | 7.213 | .008 | -6.218 | 378 | .000 | -.64868 | .10432 |
| | High | 190 | 4.7329 | .91795 | .06659 | | | -6.218 | 365.499 | .000 | -.64868 | .10432 |
| JS8 | Low | 190 | 4.0079 | 1.08803 | .07893 | 9.014 | .003 | -6.960 | 378 | .000 | -.70395 | .10115 |
| | High | 190 | 4.7118 | .87184 | .06325 | | | -6.960 | 360.857 | .000 | -.70395 | .10115 |
| JS9 | Low | 190 | 3.9368 | 1.08773 | .07891 | 9.074 | .003 | -7.439 | 378 | .000 | -.75658 | .10170 |
| | High | 190 | 4.6934 | .88440 | .06416 | | | -7.439 | 362.893 | .000 | -.75658 | .10170 |
| CS1 | Low | 190 | 4.4821 | 1.31205 | .09519 | 24.327 | .000 | -7.657 | 378 | .000 | -.91368 | .11932 |
| | High | 190 | 5.3958 | .99181 | .07195 | | | -7.657 | 351.829 | .000 | -.91368 | .11932 |
| CS2 | Low | 190 | 4.6863 | 1.24047 | .08999 | 37.619 | .000 | -7.922 | 378 | .000 | -.85158 | .10749 |
| | High | 190 | 5.5379 | .81034 | .05879 | | | -7.922 | 325.458 | .000 | -.85158 | .10749 |
| CS3 | Low | 190 | 4.2884 | 1.42263 | .10321 | 23.950 | .000 | -8.046 | 378 | .000 | -1.0400 | .12925 |
| | High | 190 | 5.3284 | 1.07257 | .07781 | | | -8.046 | 351.392 | .000 | -1.0400 | .12925 |
| CS4 | Low | 190 | 4.5653 | 1.35297 | .09815 | 23.044 | .000 | -7.977 | 378 | .000 | -1.0000 | .12536 |
| | High | 190 | 5.5653 | 1.07490 | .07798 | | | -7.977 | 359.615 | .000 | -1.0000 | .12536 |
| CS5 | Low | 190 | 4.8768 | 1.04835 | .07606 | 11.859 | .001 | -7.169 | 378 | .000 | -.69789 | .09735 |
| | High | 190 | 5.5747 | .83760 | .06077 | | | -7.169 | 360.438 | .000 | -.69789 | .09735 |
| CS6 | Low | 190 | 4.6095 | 1.23790 | .08981 | 25.740 | .000 | -8.175 | 378 | .000 | -.90737 | .11099 |
| | High | 190 | 5.5168 | .89893 | .06522 | | | -8.175 | 344.961 | .000 | -.90737 | .11099 |
| CS7 | Low | 190 | 4.8832 | 1.06071 | .07695 | 6.362 | .012 | -6.599 | 378 | .000 | -.66105 | .10017 |
| | High | 190 | 5.5442 | .88398 | .06413 | | | -6.599 | 366.103 | .000 | -.66105 | .10017 |
| OCM1 | Low | 190 | 3.2649 | .86509 | .06276 | 9.624 | .002 | -9.046 | 378 | .000 | -.74211 | .08203 |
| | High | 190 | 4.0070 | .72817 | .05283 | | | -9.046 | 367.307 | .000 | -.74211 | .08203 |
| OCM2 | Low | 190 | 3.2211 | .96878 | .07028 | 12.425 | .000 | -7.701 | 378 | .000 | -.69474 | .09021 |
| | High | 190 | 3.9158 | .77962 | .05656 | | | -7.701 | 361.465 | .000 | -.69474 | .09021 |
| OCM3 | Low | 190 | 3.2123 | .90200 | .06544 | 9.959 | .002 | -7.843 | 378 | .000 | -.66316 | .08455 |
| | High | 190 | 3.8754 | .73801 | .05354 | | | -7.843 | 363.739 | .000 | -.66316 | .08455 |
| ITW1 | Low | 190 | 5.2860 | 1.40403 | .10186 | 33.578 | .000 | -4.565 | 378 | .000 | -.56140 | .12298 |
| | High | 190 | 5.8474 | .95000 | .06892 | | | -4.565 | 332.070 | .000 | -.56140 | .12298 |
| ITW2 | Low | 190 | 5.4193 | 1.34570 | .09763 | 22.887 | .000 | -4.049 | 378 | .000 | -.48421 | .11958 |
| | High | 190 | 5.9035 | .95183 | .06905 | | | -4.049 | 340.253 | .000 | -.48421 | .11958 |
| ITW3 | Low | 190 | 5.5018 | 1.31502 | .09540 | 19.575 | .000 | -3.863 | 378 | .000 | -.46491 | .12034 |
| | High | 190 | 5.9667 | 1.01114 | .07336 | | | -3.863 | 354.599 | .000 | -.46491 | .12034 |
| ITW4 | Low | 190 | 5.2825 | 1.48569 | .10778 | 40.225 | .000 | -4.627 | 378 | .000 | -.59298 | .12814 |
| | High | 190 | 5.8754 | .95534 | .06931 | | | -4.627 | 322.477 | .000 | -.59298 | .12814 |

Table 4: T-test over the average scores of observed variables, for Low IT and High IT (continued)

| | IT | N | Mean | Std. Deviation | Std. Error Mean | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
|-----|------|-----|---------------|----------------|-----------------|---|------|------------------------------|---------|----------------|--------------|-------------------|
| | | | | | | F | Sig. | t | df | Sig. (2-tail.) | Mean Differ. | Std. Err. Differ. |
| OL1 | Low | 190 | 4.2772 | 1.10384 | .08008 | 12.300 | .001 | -4.442 | 378 | .000 | -.45965 | .10347 |
| | High | 190 | 4.7368 | .90318 | .06552 | | | -4.442 | 363.743 | .000 | -.45965 | .10347 |
| OL2 | Low | 190 | 4.2561 | 1.12473 | .08160 | 11.170 | .001 | -6.287 | 378 | .000 | -.66842 | .10632 |
| | High | 190 | 4.9246 | .93946 | .06816 | | | -6.287 | 366.381 | .000 | -.66842 | .10632 |
| OL3 | Low | 190 | 3.7702 | 1.16299 | .08437 | 11.031 | .001 | -7.765 | 378 | .000 | -.85088 | .10958 |
| | High | 190 | 4.6211 | .96391 | .06993 | | | -7.765 | 365.416 | .000 | -.85088 | .10958 |
| OL4 | Low | 190 | 3.5439 | 1.36648 | .09913 | 7.756 | .006 | -8.436 | 378 | .000 | -1.0947 | .12977 |
| | High | 190 | 4.6386 | 1.15436 | .08375 | | | -8.436 | 367.731 | .000 | -1.0947 | .12977 |
| OL5 | Low | 190 | 3.4439 | 1.35436 | .09826 | 12.940 | .000 | -8.227 | 378 | .000 | -1.0509 | .12774 |
| | High | 190 | 4.4947 | 1.12516 | .08163 | | | -8.227 | 365.712 | .000 | -1.0509 | .12774 |
| OL6 | Low | 190 | 3.4649 | 1.32480 | .09611 | 8.863 | .003 | -9.120 | 378 | .000 | -1.1491 | .12600 |
| | High | 190 | 4.6140 | 1.12302 | .08147 | | | -9.120 | 368.129 | .000 | -1.1491 | .12600 |
| OL7 | Low | 190 | 3.4158 | 1.37274 | .09959 | 18.774 | .000 | -10.02 | 378 | .000 | -1.2772 | .12747 |
| | High | 190 | 4.6930 | 1.09668 | .07956 | | | -10.02 | 360.425 | .000 | -1.2779 | .12747 |
| FP | Low | 190 | 3.2962 | .79035 | .05734 | 5.689 | .018 | -6.848 | 378 | .000 | -.50977 | .07444 |
| | High | 190 | 3.8060 | .65438 | .04747 | | | -6.848 | 365.283 | .000 | -.50977 | .07444 |

DISCUSSION

The descriptive statistics (Table 1) show that the information technologies items have values that are above average (3.00 for this questionnaire). This can be considered satisfactory. It is particularly positive that the best-rated item is the importance management places on modern IT (IT6). It is very important that top management recognizes the importance of using modern information technologies. The lowest evaluated item is training of employees to work with modern IT (T4). The weakness that has not yet been fully overcome in companies in Serbia is presented here.

The descriptive statistics (Table 2) show the average value of information technologies items and information technologies dimension, depending on various criteria. The first criterion is the gender of the CEO. There is a difference in companies where the CEO is a woman, as in these companies the information technologies items have higher values (RQ1 is answered). The second criterion is the CEO's age. As expected, the information technologies items have a higher average value in cases where the CEO is younger (under 45 years); (RQ2 is answered). The third criterion is the company's ownership structure. It is clearly seen here that in privately owned companies there is a significantly higher degree of the implementation and effects of information

technologies, as well as the motivation of employees and the importance that the company's management attaches to them (RQ3 is answered). The fourth criterion is the company's financial performance. Companies with high financial performance have higher average marks for the information technologies items and information technologies dimension (RQ4 is answered).

Table 3 shows the correlation between the information technologies items. All correlations were statistically significant, strong and positive, which can be considered an expected result. This suggests that companies have a uniform and consistent approach to information technologies: if companies possess modern information technology, then they will use it, and if they apply modern information technology, then there will be effects derived from this application, if employees are trained to work with modern information technologies, then they will be motivated for this work, and if the management assigns high importance to modern information technologies, then the company will own and use information technology.

Table 4 shows that in all cases there is a statistically significant difference in the average score of the observed variables, both the high and low value of the IT dimension. Thus, a high level of the information technologies dimension is an

indicator of the high level of the observed organizational and business performance (RQ5 is answered). All this contributes to overall employee satisfaction, which is manifested in greater job and communication satisfaction, greater organizational commitment and greater organizational trust. A high level of possession and application of information technology creates the technical basis, and the necessary organizational climate for the continuous and systematic set up organizational learning. In this way, information technologies have a positive impact on a number of organizational performances. Similar results were obtained in numerous references, for example (Nonaka et al., 1996; Bharadwaj, 2000; White et al., 2010; Lumley et al., 2011; Castellacci & Viñas-Bardolet, 2019; Céspedes-Lorente et al., 2019; Zhen et al., 2019; Tortorella et al., 2020; Wang et al., 2020).

Based on the results from Table 2, there is a mutual positive connection between information technology and financial performance. Thus, a high degree of information technology increases financial performance, and high financial performance has a positive impact on organizational performances, which can be particularly said for those analysed in this paper. Thus, it can be concluded that the possession and application of information technology is not only an indicator of the level of organizational performance in the company, but both directly and indirectly, through financial performances, have an impact on raising the level of many organizational performances in the company. In any case, if a company wants to improve the level of their organizational and financial performances, it is certainly useful (and necessary) to, among other things, continuously improve information technology.

CONCLUSION

The average values for the information technologies items are slightly above average, which can be considered a good result. The fact that the best-rated item is the importance management places on modern IT (IT6) demonstrates a good perspective of information technology in companies in Serbia. The answers to all five research questions in this paper are affirmative. The first four research questions are related to the state of information technologies items according to four different criteria. Thus, the information technologies items have higher

average values in the following cases: when the CEO is a woman, when the CEO is a younger person (under 45 years of age), and when the company is a privately owned company and has high financial performance. If a company meets two or more of these conditions, we can expect the level of information technologies items in this company to be very high.

The answer to the fifth research question is also affirmative: the degree of ownership, implementation and effects of the application of information technology, the training and motivation of employees to work with modern information technologies, as well as the importance management places on modern information technologies are all an indicator of the level of organizational performance in the company. Also, the level of information technology in the company has a direct and indirect positive impact on the level of different organizational performances. The indirect impact is realized through financial performances, in the following way: a high level of information technology enhances financial performance, and high financial performance has a positive impact on individual organizational performance.

The recommendation to top managers is to continuously and systematically invest in the purchase and maintenance of information technology, to motivate employees to work with modern information technologies, and the effects of these investments and efforts will be manifested through better business results and an improvement in the level of a number of organizational performances.

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INFORMACIONE TEHNOLOGIJE KAO POKAZATELJ NIVOVA ORGANIZACIONIH PERFORMANSI

U radu su prikazani rezultati istraživanja uticaja informacionih tehnologija (IT) na individualne i organizacione performanse, u preduzećima u Srbiji: zadovoljstvo poslom (JS), zadovoljstvo komunikacijom (CS), organizacionu posvećenost (OCM), organizaciono poverenje (ITW), organizaciono učenje (OL) i finansijske performanse (FP). Podaci su dobijeni putem upitnika, koji su popunjeni od strane N = 380 srednjih menadžera iz 102 preduzeća u Srbiji. Od metoda statističke obrade podataka korišćeni su: deskriptivna statistika, korelaciona analiza i t-test. Osnovni zaključci istraživanja su: 1. Ajtemi informacionih tehnologija, u preduzećima u Srbiji, imaju vrednosti ocena koje su nešto iznad proseka. 2. Nivo informacionih tehnologija u preduzeću jeste pokazatelj nivoa organizacionih performansi u preduzeću. 4. Nivo informacionih tehnologija u preduzeću ima direktan i indirektan pozitivan uticaj na nivo brojnih organizacionih performansi u preduzeću.

Ključne reči: Informacione tehnologije, Organizacione performanse, T-test, Srbija.