

KAKO VLADINI ZAPOSLENICI KORISTE INFORMACIJSKE I KOMUNIKACIJSKE TEHNOLOGIJE?

HOW DO GOVERNMENT EMPLOYEES USE INFORMATION AND COMMUNICATION TECHNOLOGIES?

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Prethodno priopćenje

Abstract: *Information and communication technologies have become a fundamental component of modern society and a powerful driving force for growth and prosperity. New and emerging technologies enable government to more effectively and efficiently provide their services to citizens and businesses. Today, e-government is synonymous with fast, reliable, open, and flexible public administration. In the context of e-government adoption research, the purpose of this paper is to explore how Croatian government employees use information and communication technologies at the workplace. The study was conducted on a sample of employees from central government bodies. Both descriptive and inferential statistical methods were employed in the analysis. The results show that Croatian government employees most often use the available technology for word processing, browsing business materials, communication, and information. The study also found that there are significant differences in computer and Internet use, particularly with respect to level of education and position in organization.*

Keywords: *computer and Internet use, e-government, government employees, information and communication technologies*

Preliminary communication

Sažetak: *Informacijske i komunikacijske tehnologije su postale temeljna komponenta suvremenog društva i snažan pokretač rasta i prosperiteta. Nove i nastajuće tehnologije omogućavaju vladi da pruža svoje usluge građanima i poslovnom sektoru efektivnije i efikasnije. Danas je e-vlada sinonim za brzu, pouzdanu, otvorenu i fleksibilnu državnu upravu. U kontekstu istraživanja prihvaćanja e-vlade, svrha ovog rada je ispitati kako hrvatski vladini zaposlenici koriste informacijske i komunikacijske tehnologije na radnom mjestu. Istraživanje je provedeno na uzorku zaposlenika iz središnjih tijela državne uprave. U analizi su primijenjene metode deskriptivne i inferencijalne statistike. Rezultati pokazuju da hrvatski vladini zaposlenici najčešće koriste raspoloživu tehnologiju za obradu teksta, pregledavanje poslovnih materijala, komuniciranje i informiranje. Studija je također otkrila da postoje značajne razlike u korištenju računala i Interneta, osobito s obzirom na stupanj obrazovanja i položaj u organizaciji.*

Ključne riječi: *e-vlada, informacijske i komunikacijske tehnologije, korištenje računala i Interneta, vladini zaposlenici*

1. INTRODUCTION

Over the last few decades, technological progress has changed the world dramatically. As a result of the rapid development, information and communication technologies (ICT) have become essential in our lives. Today's society depends greatly on ICT. In the world where information is the most valuable commodity, government has to provide effective and efficient public services to citizens and businesses. Modern technologies have changed the way government interacts with the public and delivers its services. ICT enable government to improve its performance and increase benefits for its customers. In this context, in recent years the term "electronic government", or "e-government", has been widely used in the media and by policy makers. Researchers have also shown interest in this field.

Silcock [1] simply defines e-government as "the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees." Similar, Löfstedt [2] considers e-government as "the term that reflects the use of information and communication technology (ICT) in public administration to change structures and processes of government organisations." According to Riad, El-Bakry, and El-Adl [3], e-government is "the continuous optimization of service delivery, constituency participation and governance by transforming internal and external relationships through technology, the Internet and new media." Reffat [4] states that e-government is "the infrastructure that governments today are building to transform the way they complete their missions." Therefore, e-government improves service delivery and reduces costs, but also increases openness and transparency.

Public administration in Croatia began to use ICT in the middle of the 1970s. However, the real development of e-government in Croatia started in the 2000s when several strategies have been adopted. In the meantime, many projects have been initiated and realized by the government authorities. The results of these projects are promising and encouraging. Various online services are now available to citizens and businesses. Significant progress has also been made in the development of ICT infrastructure. Nevertheless, additional steps should be taken to build the information society in Croatia. E-government is a crucial factor in this process.

In order to successfully implement e-government solutions it is necessary to understand how government employees use ICT. Accordingly, the main aim of this study is to explore how Croatian government employees use computers and the Internet at the workplace. In addition, the paper seeks to identify the differences in patterns of ICT use with regard to gender, age, level of education, and position in the organization (manager or not). Since these issues have not been sufficiently discussed so far, the present study provides valuable information to both practitioners and researchers.

2. RELATED STUDIES

Although there are some criticisms of the effects of ICT on the public sector, most authors agree that the adoption and implementation of new technologies is a key element in their success [5, 6, 7, 8]. Many factors affect the use of computers and the Internet by government employees. However, only a few studies have examined this important issue. Some key findings from the previous studies are presented in this section.

Lin and Popovic [9] employed the data of the General Social Survey by Statistics Canada to find out how often workers use computers and for what purposes are computers used. The authors revealed that the estimated likelihood of daily use ranged from 62% in education to 90% in public administration. The analysis showed that Canadian government employees mostly used computers for the purpose of word processing, data entry, and record keeping. The Internet and e-mail were also frequently reported functions of computer use at the workplace. In addition, two-thirds of respondents said that they used spreadsheets, while programming was the least frequently stated purpose.

The aim of the paper by Hartman et al. [10] was to determine the tasks and skills that administrative employees need for today's office. The part of their respondents was public servants. The results of the study revealed that a high percentage of administrative employees used e-mail and word processing. In comparison with entry-level workers, experienced employees performed more computer tasks such as spreadsheets, presentations, database, and Internet research.

Dolton and Pelkonen [11] explored the waged effects of computer use in Great Britain. Their data came from the Workplace Employment Relations Survey and comprised of both public and private sector employees. The study confirmed that e-mail, word processing and

spreadsheets were the most common tasks performed with a computer. In contrast, controlling or monitoring processes or machinery, computer-aided design, and programming were used the least.

In their article, Matovu and Ocholla [12] examined the status of management information systems as well as the information needs for public administration in Uganda. The authors found that ICT usage was mostly confined to word processing. About a third of respondents stated that they used spreadsheet and database management. At the time of research only a small percentage of Ugandan public servants used e-mail service and the Internet. On the basis of these findings Matovu and Ocholla concluded that most management information systems related operations remained underdeveloped.

The study by Shrama and Pant [13] was conducted to determine the status of e-readiness and awareness towards various e-governance initiatives and services in an Indian state. Their sample comprised of citizens, students, government employees, and workers from the private sector. Shrama and Pant revealed that most of the civil servants and private sector employees were aware of computers, but not with the e-governance applications. Despite of this, many of them stated that they did not use computer and Internet.

Mbatha and Ocholla [14] examined the types, usage and availability of ICT in the selected government departments in South Africa. They found that a variety of ICT have been adopted in the public sector. According to the results, all the respondents used ICT for word processing, spreadsheets, Internet access, and printing. The study also showed that civil servants in South Africa regularly used ICT to communicate with colleagues and to disseminate information.

The purpose of the study by Ibrahim [15] was to investigate the extent to which government employees in Nigeria deployed and utilised ICT tools for effective governance. The most respondents said that they were able to use word processing software and browse the Internet, but they were less familiar with e-mail. Also, the majority of the sampled employees stated that they did not know how to use spreadsheets.

The results from the aforementioned studies cannot be compared directly since there are differences in scope, methodology, sample characteristics, and also in time and space dimensions. However, some findings are common to all these studies. The results show that government employees mainly use word processing software at the workplace. The Internet and e-mail services are also widely used by civil servants. Furthermore, some authors reported a satisfactory level of spreadsheet usage. On the other hand, higher levels of computer use, that require more skills, are generally underrepresented.

3. RESEARCH METHODOLOGY AND SAMPLE

The data for this study were collected via both online and paper surveys. The questionnaire was anonymous and voluntary. The sample included employees of Croatian central government bodies. A total of 378

answers of respondents from various ministries and government offices were used in the analysis. Table 1 presents the distribution of respondents by background characteristics (gender, age, level of education, and position in the organization).

Table 1 Background characteristics of respondents

Characteristic	Frequency	Percentage
Gender		
Female	224	59,3
Male	154	40,7
Age group		
20 – 34	136	36,0
35 – 49	139	36,8
50 – 64	103	27,2
Level of education		
Secondary school	87	23,0
Undergraduate degree	228	60,3
Postgraduate degree	63	16,7
Position		
Non-manager	286	75,7
Manager	92	24,3

The sample consisted of more females than males. Also, the oldest age group was somewhat underrepresented. Most of the respondents had a graduate degree. About a quarter of the respondents were managers in their institutions.

Descriptive statistics were employed to summarize the data, while inferential statistical methods, including the Mann-Whitney and Kruskal-Wallis tests, were used to determine group differences. The level of statistical significance was set at $p < 0,05$.

4. RESULTS

The respondents were asked to estimate how often and for what purpose they use computers and the Internet at the workplace. Their responses were measured on a five-point scale ranging from 1 (never) to 5 (always). Descriptive statistics calculated on the basis of their answers are given in Table 2.

According to the mean values, Croatian government employees most often use computers for word processing and reading (browsing) business materials. E-mail is also frequently used as a form of business communication. In these three cases the median value is 5. Additionally, Croatian government employees reported that they very often use ICT to get news and information. These findings correspond to the results of previous studies.

Interaction with government bodies is less frequent. The results show that interaction with citizens and businesses is even rarer. Such findings indicate that e-government has not yet been fully realized in Croatia. The survey also revealed that presentations and spreadsheets are not often used by respondents. For the purpose of visualizing the results, the means are presented in Figure 1.

Table 2 Descriptive statistics for frequency of ICT use by government employees

Purpose of ICT use	Mean	Median	Mode	Standard deviation
Word processing	4,27	5,00	5,00	1,10
Presentations	2,21	2,00	1,00	1,27
Data entry and analysis (spreadsheets)	2,99	3,00	5,00	1,44
Reading (browsing) business materials	4,25	5,00	5,00	1,03
Business communication (e-mail)	4,21	5,00	5,00	0,99
Getting news and information	4,18	4,00	5,00	0,99
Interaction with government bodies	3,53	4,00	4,00	1,15
Interaction with citizens and businesses	2,41	2,00	2,00	1,16

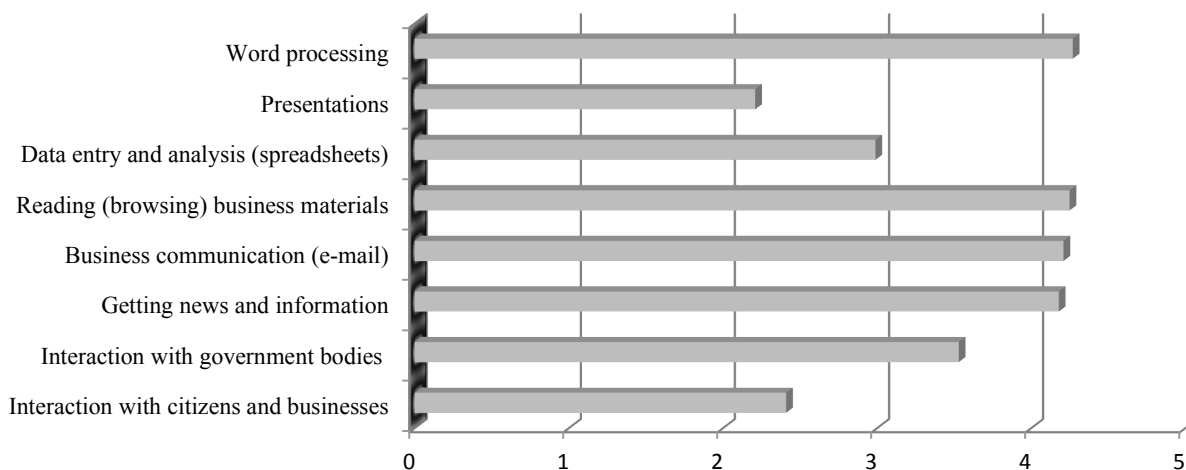


Figure 1 Means of frequency of ICT use by government employees

Table 3 Analysis of differences in the frequency of ICT use by government employees

Characteristic	Word processing	Presentations	Data entry and analysis (spreadsheets)	Reading (browsing) business materials	Business communication (e-mail)	Getting news and information	Interaction with other government bodies	Interaction with citizens and businesses
Gender	Mean rank							
Female	191,59	183,36	178,74	190,97	187,60	192,35	193,94	190,61
Male	182,84	186,13	194,98	184,94	191,03	178,03	180,66	179,36
Mann-Whitney test	Z=-0,88	Z=-0,26	Z=-1,47	Z=-0,59	Z=-0,33	Z=-1,37	Z=-1,21	Z=-1,03
Age group	Mean rank							
20 – 34	175,19	170,47	177,93	182,65	188,23	186,27	192,83	181,95
35 – 49	186,90	186,11	190,65	187,69	198,71	193,89	184,19	191,94
50 – 64	206,56	201,14	188,73	197,35	176,91	176,41	188,65	183,12
Kruskal-Wallis test	H=6,37*	H=5,25	H=1,13	H=1,33	H=2,83	H=1,77	H=0,46	H=0,74
Level of education	Mean rank							
Secondary school	106,42	118,57	137,41	125,37	121,10	144,40	119,98	123,14
Undergraduate degree	210,51	189,33	198,71	200,41	206,12	193,44	200,70	199,40
Postgraduate degree	218,61	256,52	203,92	232,96	221,09	220,28	236,79	223,39
Kruskal-Wallis test	H=82,51*	H=66,78*	H=23,38*	H=52,66*	H=53,38*	H=23,56*	H=52,62*	H=43,25*
Position	Mean rank							
Employee	176,00	167,40	176,94	176,93	179,14	181,11	179,46	177,66
Manager	224,92	237,31	212,14	224,75	219,54	203,15	216,40	211,66
Mann-Whitney test	Z=-4,29*	Z=-5,66*	Z=-2,77*	Z=-4,06*	Z=-3,37*	Z=-1,84	Z=-2,93*	Z=-2,72*

* Statistically significant at $p < 0,05$

Table 3 contains the results of the analysis of differences in the frequency of ICT use by Croatian government employees. The statistical significance of differences was tested using the nonparametric Mann-Whitney and Kruskal-Wallis tests. The Mann-Whitney test did not reveal any significant difference between female and male employees, while the Kruskal-Wallis test confirmed that only in the frequency of using word processing there are at least two age groups that differ significantly from each other. Mean ranks indicate that older employees use word processing more than younger ones.

According to the Kruskal-Wallis test, the level of education significantly affects the use of computers and the Internet at the workplace. Namely, the test results showed that in all the analysed cases there are at least two education level groups that differ significantly from each other. Employees with postgraduate degree reported the highest frequency of use, while employees with secondary school education stated that they use ICT less often.

The position in the organization also strongly influences ICT use. According to the Mann-Whitney test, managers and non-managers did not significantly differ only in terms of ICT use for the purpose of getting news and information. In all the cases, managers reported a higher frequency of computer and Internet use than their non-manager counterparts.

5. CONCLUSION

In recent years, considerable improvements have been made in the area of e-government in Croatia, but there are still many issues to be solved. Since people are the most valuable asset of any organization, a special attention in e-government design and implementation should be given to human resource development. In this sense, among other things, it is important to determine how often and for what purpose government employees use computers and the Internet at the workplace.

The present study reveals that Croatian government employees most often use ICT for word processing, reading (browsing) business materials, business communication (e-mail), and getting news and information. On the other hand, interaction with government bodies and especially with citizens and businesses is less frequent. The results also show that the level of education and position in the organization strongly influence ICT usage, while gender and age are not significant predictors of computer utilization.

The findings are mostly consistent with previous research. They indicate that government employees mainly use computers and the Internet for simple tasks. To a certain degree, such practice is understandable and can be justified by the needs of the job. Regardless, steady technological progress, which influences e-government development, requires a higher level of ICT use and, consequently, advanced knowledge and skills.

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