

Eastern Croatian Managers' Readiness for the Information Society

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Abstract. *The aim of our research was to identify the extent to which Croatian managers are prepared for the information society. The survey was carried out on a sample of 290 managers from the area of Eastern Croatia. In our analysis we tried to determine the current level of ICT equipment in the surveyed workplaces, and how much our managers support and encourage their subordinates to use modern technologies. Furthermore, in this study we investigated how managers rate their own ICT skills and knowledge acquired during formal education, through various seminars, courses and workshops, with the help of friends, or on their own.*

Keywords. Managers, information society, ICT equipment, ICT skills and knowledge

1 Introduction

The issues related to the development of technologies and their impact on modern society have frequently been in the focus of researchers' interest. In their research and papers published over the past few decades scientists have applied a range of approaches and concepts. In this period the term 'information society' has become a widely used shorthand for complex social, economic, and institutional changes related to the proliferation of information and communication technologies (ICT). According to Lievrouw [8], researchers continue to debate whether the term stands for fundamental social change or merely the extension of the principles of industrial capitalism into new areas of society. Consequently, the notion of information society is defined in a variety of ways.

Ibrahim [7] considers this as the transition from the modern and industrial age in which modes of production, exchange, and social capital are increasingly defined through information. According to Dillman [4], the term 'information society' and related concepts, such as information age and knowledge economy, describe a social system greatly dependent on information technologies to produce and distribute all manner of goods and services. Adomi and Igun [1] defined information society as a society in which the creation, storage, processing, distribution, exchange, diffusion, use, and manipulation of information is central to every social, political, cultural, economic, and ecological activity.

Building the information society is a prerequisite for creating the knowledge society. There are significant implications for the economic system arising from this transformation process. Its realization in the economic sphere depends directly on managers, who need to be aware of the conditions where information and knowledge are dominant as the primary resources, and consequently have to master adequate skills in using ICT.

Gitman and McDaniel [6] separated the growing use of information technology as one of the four important trends in management today (the others are crisis management, outside directors, and the increasing need for global management skills). In recent decades ICT have become a necessary ingredient for managers to be successful. ICT help managers to improve the efficiency and effectiveness of business processes in a rapidly changing environment. This is the reason why ICT have to be seen as an investment and not an expense.

ICT facilitate organizational activities and processes. That role of ICT becomes more important with time. Turban, McLean and Wetherbe [13] conclude it is necessary that every manager and professional staff member learn about information technology not only in his or her specialized field, but also in the entire organization and in interorganizational settings as well. According to Lucas, Jr. [9], in the technology revolution companies use information technology for processing and accessing information. Such technology helps the organization collect, store, retrieve, and apply knowledge to solve problems, i.e. information technology converts the raw material of information into useable knowledge.

The aim of the research presented in this paper was to determine the extent to which Croatian managers are prepared for the information society. In our analysis we tried to determine the current level of ICT equipment, and how much managers from the area of Eastern Croatia support and encourage their subordinates to use modern technologies. We also investigated how managers rate their own ICT skills and knowledge acquired during formal education, through various seminars, courses and workshops, with the help of friends or on their own. In the paper, the differences according to gender, age group and education level of managers were analyzed.

2 Literature review

The process of ICT implementation in business has prompted researchers to analyze different aspects of technology usage by managers. The available sources provided several papers that investigated manager attitudes on ICT, i.e. on their needs in the information society.

Fripp [5] described a survey carried out among managers at Ashridge Management College (United Kingdom). The managers reported how they used information technology, and what the advantages and difficulties were. Fripps' research confirmed that there are many potential advantages to be gained by using information technology.

Vlahos and Ferratt [15] in their study developed a profile of managers of corporations in Greece, focusing on the amount of information technology use and the value of and satisfaction with computer-based information in making decisions on planning, controlling, and operating. Their analysis of survey responses indicated that managers used information technology as a valuable, everyday tool. All levels of management rated computer-based information the highest in supporting the evaluation step in decision making. The first line supervisors and information systems managers were most satisfied with computer-based information systems.

O'Brien and Wilde [10] examined the direct application and importance of information technology to the jobs and skills that Australian managers possessed. The results showed that the majority of managers had access to and used

at least the traditional computer applications. O'Brien and Wilde also examined the influence of a training exercise on participants' attitudes towards specific systems and concepts. Their results indicated a favourable shift in attitude as an outcome of the management training program.

Vlahos, Ferratt and Knoepfle [16] surveyed German managers to investigate their use of information technology. The results show that these managers were relatively heavy information technology users, with over 10 hours of use per week. Also, there was a significant correlation between the amount of use of information technology and perceived value of the computer-based information systems, as well as between satisfaction with and perceived value of the computer-based information systems.

The purpose of the paper written by Vehovar and Lesjak [14] was to study the characteristics and impacts of ICT investments as perceived by ICT managers in Slovenia. The authors found that the size of ICT investments strongly determined the perception of ICT investments, but it had surprisingly little impact on its structure. Particular in small companies, satisfaction with ICT investments was relatively low. According to Vehovar and Lesjak, the clearest effect of ICT investments was the greater need to educate the employees.

Bross and Cronjé [2] polled managers of a large governmental organisation in the Netherlands, about their experiences with information, communication and technology in their working environment. The authors consider that dealing effectively with ICT in the information society is a complex task and the human dimension is often under-estimated. Bross and Cronjé found that managers knew full well that their strongest need was for a conceptual understanding of the implications of ICT in their changed work environment. The results emphasize that as education is increasingly need-driven instead of content-driven it is necessary to reconsider the curricula of higher educational institutes. Furthermore, their research highlights a need for on the job training.

It should be noted that the presented papers are only marginally related to our research, thus our results are not directly comparable with those presented in the other sources.

3 Instrument, methods and research limitations

We designed a survey instrument to collect data about managers' experiences and perceptions on ICT usage. The data were collected by means of a written questionnaire which consisted of two parts. The first part of the questionnaire included general demographic questions, whereas the second contained the group of questions related to ICT. Each manager was provided oral instructions on how to fill in the questionnaire from a poll-taker.

Both descriptive and inferential statistical methods were used to analyze the data. First, a frequency analysis was conducted and percentages were calculated based on the sample of respondents and their answers. In addition, we calculated descriptive statistics for age, and research variables. Statistical significance of differences was determined by non-parametric Kruskal-Wallis and Mann-Whitney tests. They were used because the Kolmogorov-Smirnov and Shapiro-Wilks tests could not confirmed that the formed sample groups, which in some cases were not large enough, came from normally distributed populations. Kruskal-Wallis test is used to determine whether the mean ranked scores for three or more unrelated samples differ significantly, while Mann-Whitney is used to determine whether scores from two unrelated samples differ significantly from one another [3].

We set the statistical significance level at $p < 0.05$. The data analysis was performed using the statistical packages SPSS [11] and Statistica [12].

The results must be considered with caution, because the representativeness of the sample cannot be determined. The reason for that is a lack of information on the overall size and structure of the population of Croatian managers, including those from Eastern Croatia.

4 Sample

The survey included 290 managers working in companies from the area of Eastern Croatia. In the sample, there were 168 male (57.93%), and 122 female respondents (42.07%).

Table 1: Distribution of respondents by age group

Age group (years)	Number of respondents	Percent
21-35	96	33.10
36-50	143	49.31
51-65	51	17.59
Total	290	100.00

The largest number of respondents was aged between 36 and 50. Respondents' average age was 40.94 years, with a standard deviation of 9.92 years. The youngest manager was 21 years, and the oldest was 65 years, while median value was 41 years.

Table 2: Distribution of respondents by education level

Education level	Number of respondents	Percent
Secondary school	122	42.07
Two-year college	66	22.76
University degree	102	35.17
Total	290	100.00

The largest number of respondents had only secondary school education, and for the most part, they belonged to lower management. In our sample, 95 respondents (32.76%) were lower managers, 126 respondents (43.45%) were middle managers, and 69 respondents (23.79%) were top managers.

Table 3: Distribution of respondents by firms' size

Number of employees	Number of respondents	Percent
49 or fewer	133	45.86
50 to 249	76	26.21
250 to 499	42	14.48
500 or more	39	13.45
Total	290	100.00

Almost half of the respondents were from companies employing less than 50 people.

The study was comprised of 246 respondents (84.83%) from private enterprises, and 44 respondents (15.17%) from government-owned and mixed-owned enterprises.

5 Results

Our research indicates that the majority of respondents have a computer available at work. Out of 290 managers surveyed, as many as 274 (94.48%) stated that they had and used a computer at work - in the company or institution where they were employed. There were only 16 managers (5.52%) in the sample who did not have a computer at their workplace. A relatively large number of respondents also stated that they had Internet access. More precisely, 259 respondents (89.31%) gave this statement, whereas 31 managers (10.69%) said they had no Internet access at their workplace.

Table 4: Distribution of respondents in terms of type of Internet access in the workplace

Internet access	Number of respondents	Percent
Dial-up	21	8.11
ADSL	206	79.54
WLAN	32	12.36
Total	259	100.00

Almost 92% of respondents who had Internet access at work, which accounts for 82.07% of the total number of managers in the sample, stated that they were using ADSL or WLAN, that is, broadband Internet connection. This encouraging result indicates how intensively ICT infrastructure has been developing in the Republic of Croatia over the past few years.

The responses about the weekly work-related computer usage varied considerably. The managers spent 20.6 hours per week on average using the computer for business purposes, with a standard deviation of 14.88 hours. The median value was 20 hours.

Table 5: Basic descriptive statistics related to computer usage in terms of respondents' gender

Respondent's gender	Computer usage (hours)	
	Mean	Median
Male	18.17	16.00
Female	23.96	20.00

On average, business-related computer usage is more extensive with female respondents - 5.79 hours per week. For this group a higher median value was calculated as well. The results of the Mann-Whitney test show that there is statistically significant difference in the weekly work-related computer usage when it comes to the gender of managers ($Z=-3.079$, $p=0.002$). The obtained result can be explained by the fact that among women managers the younger generation is more represented than among their male counterparts.

Table 6: Basic descriptive statistics related to computer usage in terms of respondents' age

Age group (years)	Computer usage (hours)	
	Mean	Median
21-35	25.17	25.00
36-50	19.70	16.00
51-65	14.55	15.00

Managers within the youngest age group were the ones with the highest average time of business-related computer usage (the median value calculated for this group was also the highest). Respondents within the oldest age group showed the lowest work-related usage of computer. The result of the Kruskal-Wallis test indicates that there is a statistically significant difference among the three age groups in terms of weekly business-related computer usage ($H=19.153$, $p=0.000$).

Using the Mann-Whitney test it was found that the differences in computer usage between all the age groups of managers are statistically significant (Table 7).

Table 7: Mann-Whitney test results

Mann-Whitney test	Compared age groups (years)		
	21-35 36-50	21-35 51-65	36-50 51-65
Z	-2.856	-4.264	-2.187
p	0.004	0.000	0.029

Among managers with secondary school education business-related computer usage was the lowest in comparison with the other two groups.

Table 8: Basic descriptive statistics related to computer usage in terms of respondents' education level

Education level	Computer usage (hours)	
	Mean	Median
Secondary school	19.73	15.00
Two-year college	20.14	20.00
University degree	21.95	20.00

The result of the Kruskal-Wallis test indicates that there is no significant difference in computer usage across the three education level groups ($H=3.137$, $p=0.208$).

The sample comprised 115 respondents (39.66%) who had attended a computer course, whereas 175 managers (60.34%) never went through additional ICT training.

Within the survey, managers were also asked the following questions:

- How do you rate your own ICT literacy? (V1)
- How helpful is ICT in performing managerial tasks? (V2)
- To what extent do you support the introduction of ICT in the company or institution that you work for? (V3)
- How much do you encourage your subordinates to use ICT? (V4)

The stated questions were meant to determine how prepared eastern Croatian managers are for the information society, in which ICT usage is a

fundamental activity. Responses to the questions were measured using a five-point Likert scale that ranged from 1 (lowest rating) to 5 (highest rating). Table 9 presents basic descriptive statistics related to the questions.

Table 9: Basic descriptive statistics

Variable	Descriptive statistics		
	Mean	Median	Standard deviation
V1	3.51	4.00	0.99
V2	3.66	4.00	1.14
V3	4.34	5.00	0.96
V4	3.93	4.00	1.10

The interviewed managers estimated their own ICT literacy level with the average grade 3.51. Managers gave the slightly higher average score to the usefulness of ICT in solving managerial problems. The obtained results indicate that managers give significant support to ICT introduction into the companies and institutions they work for, and also encourage their subordinates to use these technologies.

With the aim of establishing the significance of differences between male and female managers we conducted a Mann-Whitney test.

Table 10: Basic descriptive statistics and results of the Mann-Whitney test

Variable	Gender	Descriptive statistics		Mann-Whitney test
		Mean	Median	
V1	Male	3.49	4.00	$Z=-0.096$
	Female	3.53	4.00	$p=0.924$
V2	Male	3.63	4.00	$Z=-0.118$
	Female	3.69	4.00	$p=0.906$
V3	Male	4.23	5.00	$Z=-2.605$
	Female	4.49	5.00	$p=0.009$
V4	Male	3.81	4.00	$Z=-2.113$
	Female	4.09	4.00	$p=0.035$

Mann-Whitney tests indicate that there are two statistically significant differences: the one regarding support for the ICT introduction (V3), and the

other regarding encouraging subordinates to use ICT (V4). In both cases, female managers gave a higher grade.

As expected, managers from the youngest group gave the highest average grades to their own ICT literacy, helpfulness of ICT in performing managerial tasks, support to ICT introduction, and encouraging subordinates to use ICT (Table 11). In contrast, managers from the oldest group gave the lowest grades when answering these questions.

Table 11: Basic descriptive statistics and results of the Kruskal-Wallis test

Variable	Age group (years)	Descriptive statistics		Kruskal-Wallis test
		Mean	Median	
V1	21-35	3.93	4.00	$H=33.750$ $p=0.000$
	36-50	3.45	3.00	
	51-65	2.86	3.00	
V2	21-35	3.93	4.00	$H=17.726$ $p=0.000$
	36-50	3.69	4.00	
	51-65	3.04	3.00	
V3	21-35	4.53	5.00	$H=13.965$ $p=0.001$
	36-50	4.37	5.00	
	51-65	3.90	4.00	
V4	21-35	4.01	4.00	$H=6.366$ $p=0.041$
	36-50	3.99	4.00	
	51-65	3.60	4.00	

With all the variables, the results of the Kruskal-Wallis test indicate that there is a statistically significant difference among the three age groups. According to the Mann-Whitney test results, which will not be cited here due to limited space, there are statistically significant differences in all the grades given by the oldest managers as opposed to those from the other two groups. The only statistically significant difference between managers in the youngest and middle age group refers to their assessment of own ICT literacy.

Table 12 lists the results of the Kruskal-Wallis test and basic descriptive statistics calculated for responses of managers who were grouped according to their level of education. In all the cases the highest average grades were given by managers with a university degree, and the lowest by managers with secondary school education.

Table 12: Basic descriptive statistics and results of the Kruskal-Wallis test

Variable	Education level	Descriptive statistics		Kruskal-Wallis test
		Mean	Median	
V1	Secondary school	3.17	3.00	$H=25.284$ $p=0.000$
	Two-year college	3.75	4.00	
	University degree	3.76	4.00	
V2	Secondary school	3.38	3.50	$H=8.367$ $p=0.015$
	Two-year college	3.82	4.00	
	University degree	3.88	4.00	
V3	Secondary school	4.07	4.00	$H=15.538$ $p=0.000$
	Two-year college	4.53	5.00	
	University degree	4.55	5.00	
V4	Secondary school	3.63	4.00	$H=14.644$ $p=0.001$
	Two-year college	4.11	4.00	
	University degree	4.15	4.00	

The results of the Kruskal-Wallis test again indicate that there is a statistically significant difference among the three groups. According to the Mann-Whitney test results, the assessments of managers with secondary school education show a statistically significant difference from those by managers with college and university degrees. The test did not confirm statistical significance of any of the differences between managers with a college degree and those holding a university degree.

In order to determine the ways in which eastern Croatian managers acquired computer-related skills, the following items were included in the questionnaire:

- Assess ICT skills that you acquired in the course of your formal education (V5)
- Assess ICT skills that you acquired through seminars, training courses and workshops organized outside formal education (V6)

- Assess ICT skills that you acquired through friends (V7)
- Assess ICT skills that you acquired on your own (V8)

Table 13 presents basic descriptive statistics related to the questions.

Table 13: Basic descriptive statistics

Variable	Descriptive statistics		
	Mean	Median	Standard deviation
V5	2.60	3.00	1.21
V6	2.66	3.00	1.32
V7	3.56	4.00	1.02
V8	3.85	4.00	0.99

The interviewed managers believe that they gained most knowledge on using ICT on their own. The second-highest grade was given to ICT skills gained through friends, which is followed by the assessment of skills acquired through seminars, training courses and workshops organized outside formal education. The lowest grade was given to ICT skills acquired in the course of formal education.

6 Conclusions

The intensive development of ICT has had a strong impact on all the areas of human activity. However, the implications of this process are particularly strongly felt in the economy. What resulted from the process is the emergence of the information society as a prerequisite for the knowledge society. In the environment where information and knowledge have become primary resources, managers need to master adequate skills in using ICT. Our intention was to investigate to what extent eastern Croatian managers are prepared for the information society.

The analysis revealed that almost 95% of managers have a computer at their workplace. Nearly 90% of managers stated that they had Internet access, mostly through broadband connections. The managers spent 20.6 hours per week on average using the computer for business

purposes. Computers were predominantly used by female managers and younger managers. When assessing their own ICT literacy, managers gave the average grade 3.51, whereas the support to the introduction of ICT in the company or institution that they work for received the average grade 4.34. In comparison to managers from the older age group, those from the younger and middle age group gave higher average grades to their own ICT literacy, helpfulness of ICT in performing managerial tasks, support to ICT introduction, and encouraging subordinates to use ICT. In all the stated cases, managers with college and university degrees gave higher average grades. According to the research results, managers believe that they acquired most ICT skills on their own, and the least during formal education. Such attitudes indicate that it would be essential to formulate new curricula, which would correspond more closely to the needs and requirements of modern managers.

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