

An Empirical Review of the Internet Technology Application in Large Croatian Companies

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Abstract: The modern information-communication technologies, as the Internet and World Wide Web (WWW) facilitate new approaches to promote companies and improving sell their products and services. This paper presents an empirical review of the Internet application in the 100 large Croatian companies. The companies with the Internet access and the content of their Web sites were analysed. The aim of the survey was to find out the extent the Croatian firms have recognised the advantage of the Internet and electronic commerce and to point out the factors that can influence it.

Keywords: electronic commerce, e-mail, Internet, large Croatian companies, WWW

JEL Classification: M1, M10

Introduction

The aim of the survey was to investigate the level of the Internet technology application in Croatian large companies. The study was conducted using a questionnaire survey offered to the information technology managers in 100 Croatian firms that have been chosen from the list of 400 companies with the highest revenue in 1997. This paper presents and discusses how the Internet and the World Wide Web are used in the large Croatian companies. The main goal of this study is to identify to

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what extent Croatian firms have recognised the opportunity of the business use of the Internet, and to find out how firms communicate with their customers through the Web sites.

Internet, e-mail and World Wide Web (WWW)

The Internet is a global information system - a loose confederation of independently managed packet-switching networks that use a common communication protocol (TCP/IP). Text, graphics, sound and video can be transferred by Internet. It is an ideal medium for communication, commerce, and transmission of information and entertainment. In the beginning (1960s), the Internet was a public funded, non-commercial network, which has resulted in the market-oriented network. After the development of the World Wide Web (WWW) in 1992, the Internet became a virtual version of physical markets. Process innovations enabled by the Internet promise great benefits to companies and organisations.

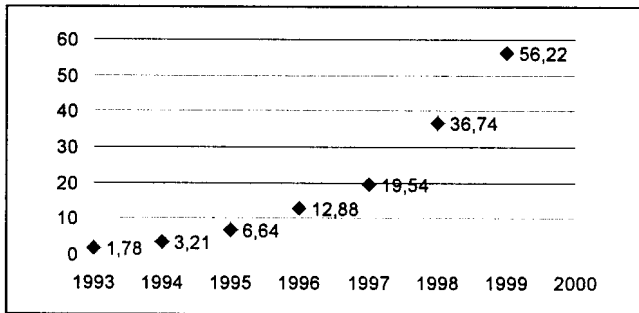
The rapidly growth of Internet hosts indicates that the Internet is going to become an increasingly standard tool for business use (Figure 1). There are different surveys about the number of Internet users. Matrix Information & Directory Services (MIDS) estimates that there were 57 million users of the Internet in the 1997, while the number of users in the year 2000 will be 377 million (Quarterman, 1997). Morgan Stanley estimates that there will be 150 million users by the year 2000. Even though these numbers differ by as much as 227 million users, the underlying assumption is the same: the Internet will experience continued growth in terms of consumer usage (Strategy Alley, 1998).

E-mail (electronic mail) is electronic transmission of letters, messages and/or electronic files from one computer to another, usually over the Internet. Electronic mail can help improve the quality and range of communications and increase the frequency and speed of communications between employees, contacts with customers and supplier organisations. There are many advantages for companies to conduct e-mail: messages and electronic files can be sent quickly, messages can be sent to a number of people at once and costs (paper, telephone and fax calls) are reduced.

The World Wide Web (WWW, Web) is an open ended networked hypertext system (Netcraft, 1996). It is the Internet application that uses hypertext links between remote network servers for accessing and displaying multimedia information. The Web allows users to interactively access hypermedia content and to communicate with each other. These unique forms of interactivity; 'machine-interaction' and 'person-interaction', have contributed to rapid diffusion of Web as a commercial medium (Hoffman and Novak, 1996). The Netcraft Web Server Survey is one of

many recent surveys about the Web Server software usage on Internet (Netcraft, 1998). The survey conducted in May 1998 has collected responses from 2.308.502 sites. The results of the September 1998 survey were responses from 3.156.324 sites that showed fast growth of Internet Web sites. Similar survey in Croatia found about 620 sites in March 1998, but the number was doubled in the period of 5 months - there were 1236 sites in August 1998 (CROSS, 1998). This number increased to 2624 Web sites under .hr Internet domain in September 1999. (CROSS, 1999).

Figure 1.: Growth of Internet Hosts, 1993-1999 (millions)



Businesses and consumers agree that exchanging information efficiently and accurately determines the success of the business. The World Wide Web provides global business interaction. It is a new medium through which organisations can communicate with the customers and because of its unique characteristics, it is one of the most important services on the Internet today (Palmer and Griffith, 1998).

Electronic commerce on the Web

Electronic commerce is a modern business methodology that addresses the needs of organisations, merchants, and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery (Kalakota and Whinston, 1996). It is associated with the buying and selling of information, products and services via computer networks. It represents the digital convergence of business applications and hardware. During the last twenty years computer hardware has become much more available at every decreasing prices, while software has become more powerful and user-friendly. Because of that, every type of businesses and consumers can participate in the electronic commerce. A survey of Internet users conducted in November 1998 by IntelliQuest found that 81 per cent intended to shop

or buy on-line the next year (NOP Research Group by Spectrum, 1999). Forrester survey is predicting that business conducted on the Internet world-wide will be worth \$1.3 trillion by 2003 (Forrester survey, 1999.).

Electronic commerce enables easy and quick information sharing with business partners and makes possible focusing on strategic goals and activities. The Web made electronic commerce a cheaper way of doing business and enabled small businesses to compete with multinational companies (Kalakota and Whinston, 1996). There are many advantages for companies to conduct electronic commerce on the Internet: fast and inexpensive way to attract new customers, enhanced quality of customer service, shorter cycle times, opportunity to sell 24 hours a day, 7 day a week, lower costs of performance because of reduced labor and resources needed.

Today, the Internet is becoming one of the most important marketing tools. The most effective promotional tool is the ability of the Web to carry the messages of marketing and communication professionals to targeted groups. There is also the ability to get continuous and real-time information about the customer satisfaction. Understanding what comprises a satisfied customer is an essential factor of the success in the global market competition (Gogan, 1998).

The Web-based marketing activities and Web sites design are driven by the interaction among the firm's market offering, marketing activities and technical characteristics (Palmer and Griffith, 1998). Marketing and commerce activities supported by the corporate Web site have significant influence to the commercial success. There are four main fields of business activities on the Web sites: customer communication, pre-sales support, selling on the Web and after-sales support (Liu et al, 1997).

The functions like guest book, messages from CEO, index/directory of the company and links to other sites support customers communication with the corporate management. Pre-sales support is concerned about company overview, products/services on-line catalogue, financial fact overview, news release and search utility. Selling on the Web is supported by on-line business: on-line ordering and on-line payment. The functions like customer service, interactive feedback and FAQ can facilitate the after-sales activities.

The Web sites of the Croatian companies are analysed according to these four main fields and the results of the analysis are compared to the results of previous survey that was made on '400 biggest' Croatian companies in 1998. (Pejić Bach and Bosilj Vuksić, 1998).

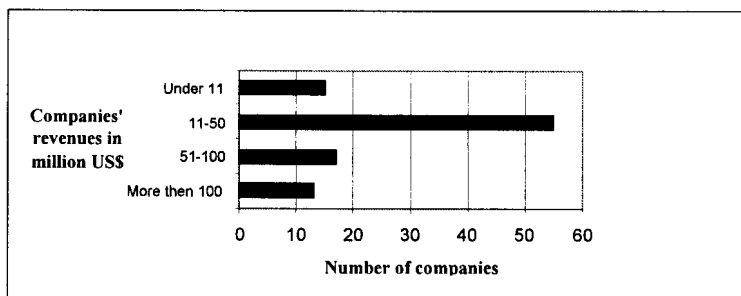
Methodology of the Survey

This survey was conducted on the sample of 100 Croatian large companies during February 1 - March 15, 1999. Although these companies do comprise a relatively small number of Croatian firms, they play important role in Croatian economy. The firms have been chosen based on their revenue, holding large assets and capital. Main data source on Croatian 'biggest' companies was the special issue of *Privredni Vjesnik* (June 29, 1998.), which includes all industries except banking.

The survey was constrained by time and money. Because of the large expenses, the survey was conducted on the limited number of companies in the relatively short period of time. Some 35 companies rejected to cooperate as they considered the time of the survey as was inconvenient for them. In that case, the other companies were selected from the list of '400 biggest' companies in Croatia.

The companies were selected according to their location and economic strength of the region. The survey was conducted in the four largest cities in Croatia: Zagreb, Rijeka, Split and Osijek. Most of the examined companies were from Zagreb (60 companies), 14 from Rijeka, 13 from Split and 13 from Osijek. The distribution of companies according to their revenue is shown in the Figure 2.

Figure 2: The distribution of the companies according to their revenue



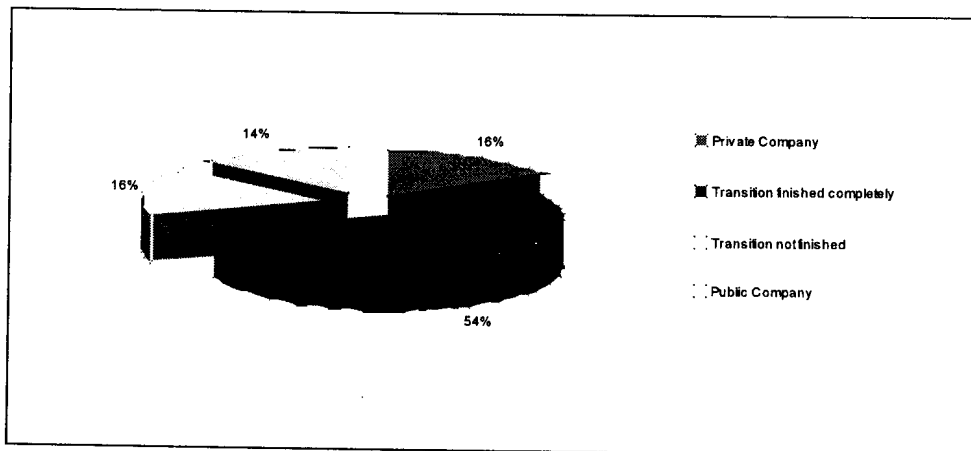
The percentage of examined companies within each industry is shown in Table 1. Business entities have been classified into different industry types according to the National Classification of Economic Activities that is based on the European Classification of Economic Activities NACE Rev 1. which is obligatory for all EU member-states (Central Bureau of Statistics, 1997).

Table 1: The examined companies and '400 biggest' according to the industry type

INDUSTRY TYPE	Number of examined companies	'400 biggest' companies
A Agriculture, hunting and forestry	2	12
B Fishing	0	2
C Mining and quarrying	1	4
D Manufacturing	29	138
E Electricity, gas and water supply	5	14
F Construction	6	24
G Wholesale and retail trade	33	124
H Hotels and restaurants	4	14
I Transport, storage and communication	12	36
J Financial intermediation	1	4
K Real estate, renting and business activities	7	26
O Other community, social and personal service activities	0	2
Total	100	400

The level of transition of the selected companies is shown in the Figure 3. More than a half of the examined companies have completely finished the transition, 16 companies are still in the process of the transition. 16 of them are founded as private companies, 14 are public companies (only 10 completely in the ownership of state).

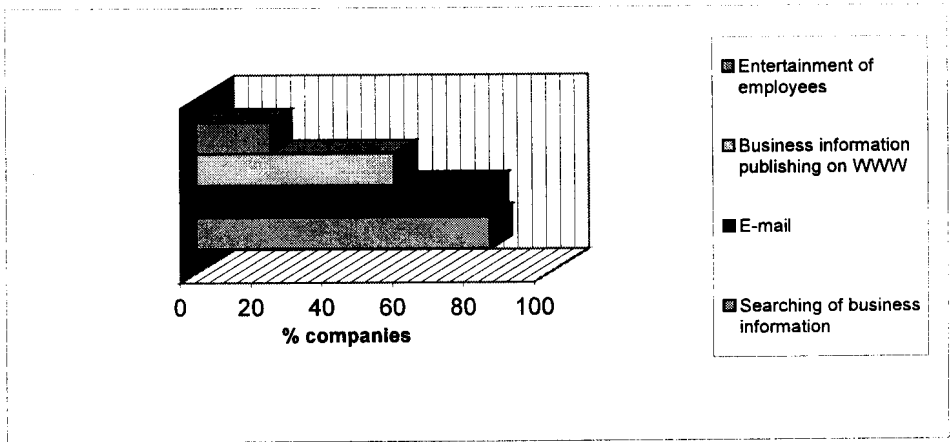
Figure 3: The level of the transition of the examined companies



Analysis of the Internet application

The results of the survey show that 82 (82 per cent) examined companies have the Internet access while a survey of the Internet access in G7 large companies found that 79 per cent companies in 1999 have Internet access (NOP Research Group by Spectrum, 1999). Among 82 Croatian companies with Internet access, 88 per cent of them use the complete Internet services, while 12 per cent use only e-mail. The companies with complete Internet service use the Internet mostly for e-mail and searching of business information of the Web (Figure 4). More than a half of them (56 per cent) use the Internet for business information publishing on the World Wide Web. Even 21 per cent of the examiner declared that the Internet in their companies is used for the entertainment of the employees.

Figure 4: Use of the Internet in the companies



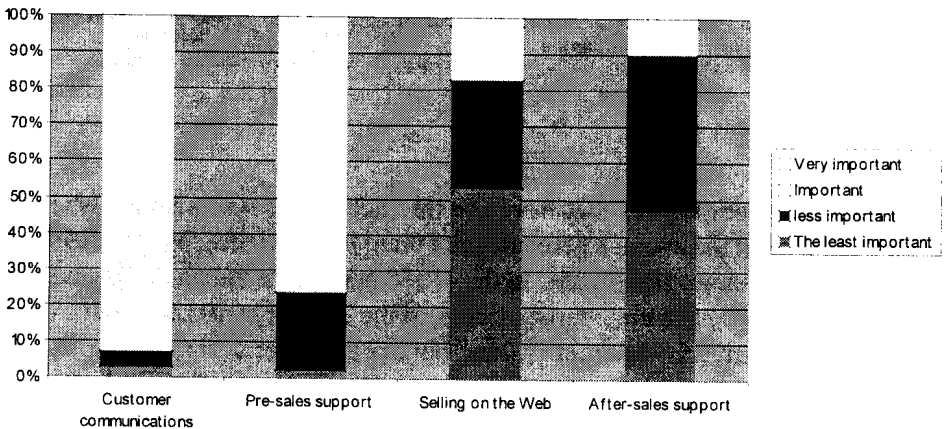
The number of employees that have the Internet access was also analysed. The answers showed that the average percentage of them is 16 per cent, but the differences among the companies are significant. In the 41 (50 per cent) companies less than 5 per cent of the employees have the Internet access, in the 7 (9 per cent) companies 100 per cent of employees have the Internet on-line, but in 18 (22 per cent) companies only 1 per cent of employees have a direct access on the Internet. The analysis of the companies with Internet access showed that 65 per cent of those companies have employees responsible for managing it (the average number of such employees in the company is 2), but 35 per cent of companies have not such employees.

The Investigation of the Companies with the Web Sites

A survey of Web sites of '400 biggest' Croatian companies conducted in 1997 found that 25 per cent companies had the Web sites (M.Pejić Bach and V.Bosilj Vuksić, 1998). The presented survey, conducted two years later, show that among 100 examined companies even 49 per cent have the Web sites. Almost one third (28 per cent) of the Web sites was developed, designed and published by the employees in the companies, 26 per cent of companies having the Web sites used the advisory service of the consultants firms, while firms specialising in the Web sites development were engaged in 46 per cent of companies.

The examinees in the companies ranked the goals of their Web sites according to the importance for the company (Figure 5). The analysis of the Web sites according to their goals showed that the customer communication has great importance for 84 per cent of examined companies with the Web sites, but only 2 per cent of them think that selling on the Web and after-sales support could have the greatest importance for them. Even 52 per cent of 49 examined companies think that selling activities have the low significance for them, while 45 per cent have the same opinion about the after-sales support activities.

Figure 5: Goals of the Web sites



According to these results, main objective of large companies is to announce their presence in the cyberspace, to present their brief history, organisation and

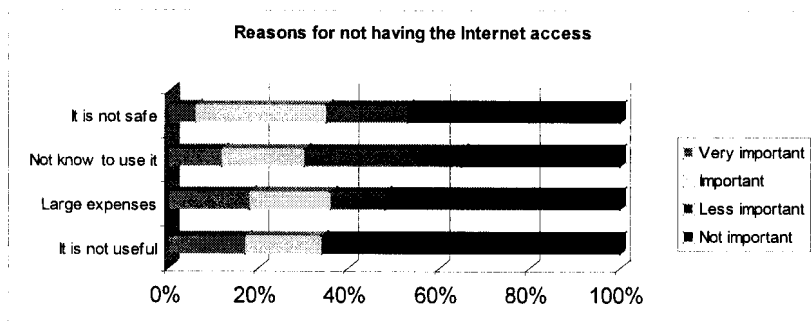
capabilities, to enhance relationship with their customers, and to provide information about their products and services. However, the main objective is to attract the customer's attention, communicate and then make a business by traditional channels and means. The results confirm the trend recognised in the survey of '400 biggest' Croatian companies in 1997.

The Companies Without the Internet Access and Web Sites

The Internet offers its users a number of benefits, but there could also be some barriers to the introduction of the Internet in the companies' business. The main reasons for not having the Internet access are analysed.

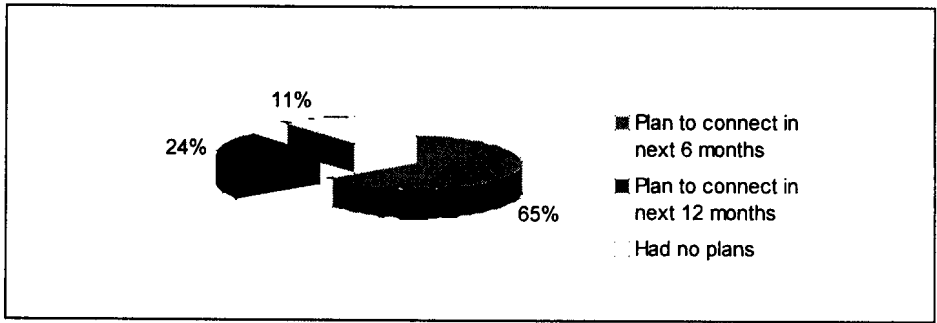
Among 100 examined companies, 18 have no access on the Internet. The reasons for that and their importance are analysed in the Figure 6 (the sums of the columns need not to be 100, as the reasons are not ranked). About one third of those companies point out large expenses, lack of knowledge and security as very important or important reasons for not having access on the Internet. Most of them share the opinion that the Internet is not useful and not necessary for their business.

Figure 6: Disadvantages of the Internet access



About two thirds of companies found out above reasons as less or unimportant. Due to such an attitude of the survey, 65 per cent of companies without the Internet access plan to connect on it in next 6 months, 24 per cent will do it during the period of one year, while only 11 per cent have no plans about it (Figure 6). It is obvious that we could expect the growth of number of companies having access on the Internet.

Figure 7. Analysis of the companies without the Internet access



Among 100 companies examined 51 per cent have no Web sites. The analysis of the companies without the Web sites show that almost half of them planned to publish it in the period of 1 year, 36 per cent would publish it in next 6 months, 3 per cent would do it in the period of 2 years, while even 13 per cent of them had no plans about it (Table 2). The main reasons are the lack of the top-management support, insufficient resources (people and money); costs of developing the platform, products and services need physical delivery (not appropriate for e-commerce).

Table 2. Analysis of the companies without the Web sites

Web sites	% Companies
Plan to publish in next 6 months	36
Plan to publish in the period of 1 year	48
Plan to publish in the period of 2 year	3
Had no plans	13
Total	100

Characteristics of the Companies and the Probability of Having the Internet and The Web Sites

In this survey the companies were also analysed according to their level of transition. The results are shown in Figure 8. Both public and private companies have a higher percentage of the Internet access (90 per cent-94 per cent) and Web sites (56 per cent-80 per cent). The companies that have finished the process of transition have a lower percentage of the Internet access (81 per cent) and the Web sites (46 per cent), but the lowest percentage have companies where this process is still not finished (75 per cent of them have the Internet access, 44 per cent of them have the Web sites). The

process of transition is usually very complex and financially demanding period for the companies trying to develop new market strategies. Because of that, companies are not able to focus the attention on the Internet and the Web sites.

The examined companies are distributed into four groups according to their revenues in 1997. An analysis of companies having the Internet and the Web sites based on their revenue revealed that higher the revenue; higher is percentage of companies with the Web sites (Table 3). Among 13 companies that have the revenue above 100 million US\$, twelve (92 per cent) have the Internet and ten (77 per cent) have the Web sites.

Figure 8. The level of transition and probability of having the Internet technology

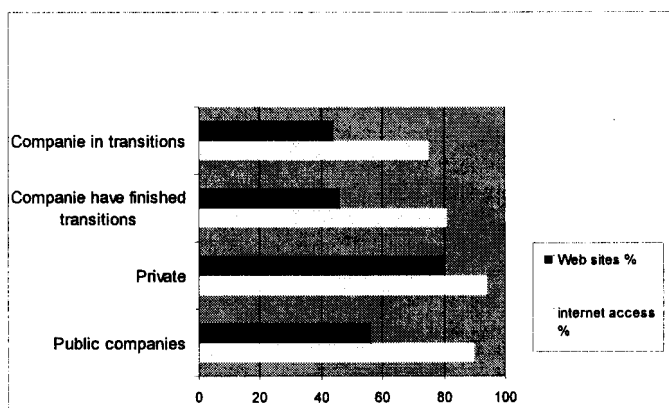
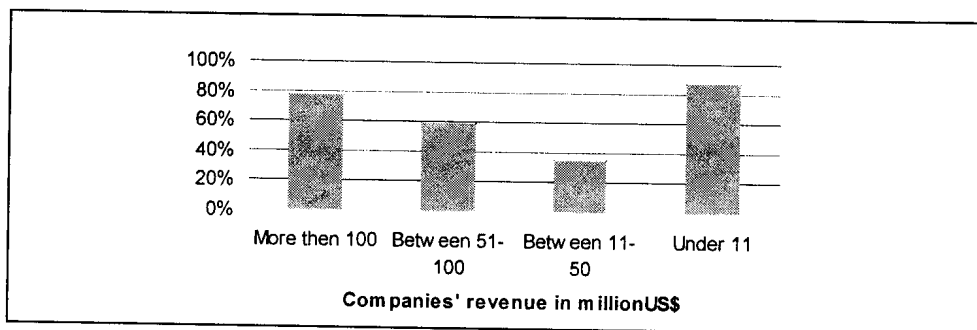


Table 3: Percentage of companies having Internet and Web sites according to the revenue

Companies' revenue in million US\$	Number of companies	Number of companies having Internet	Number of companies having Web sites
More then 100	13	12 (92%)	10 (77%)
Between 51-100	17	15 (88%)	10 (59%)
Between 11-50	55	42 (76%)	19 (35%)
Under 11	15	13 (87%)	10 (87%)
Total	100	82 (82%)	49 (49%)

There is also the vice versa connection because the percentage of companies with the Internet and the Web sites is growing in the lowest class of the revenue (under 10 million US\$). It is obvious that 'smaller' companies try do gain their competition by investing into the modern information technologies like the Internet (Figure 9).

Figure 9: Percentage of companies having the Internet and the Web sites according to the revenue



The human factor is of great importance for the success of organisational changes and business process development. Top-management support is one of the essential enablers of information technology development. Surveyed 63 companies answered positively about the top-management support, 54 (86 per cent) of them have access to Internet and 34 (54 per cent) of them have the Web site. More than one-third (37 examinees) think that the management support should be better (Table 4).

Table 4: Influence of the top-management support on the Internet access and the Web sites of companies

Top-management support to IT development	Number of companies	Number of companies having Internet	Number of companies having Web sites
Support should be better	37	28 (76%)	15 (41%)
Support is sufficient	63	54 (86%)	34 (54%)
Total	100	82 (82%)	49 (49%)

The analysis of the companies having the Internet shows that 54 (approximately 66 per cent) of them are satisfied with their management support. Similar is with the companies having the Web sites: 34 (about 69 per cent) of them think that they have appropriate support of the top-management.

Conclusions

The rapid growth of Internet hosts, Internet users, Web sites, and electronic commerce indicates that the Internet is going to become the standard tool for business use in near future. Almost 82 per cent of 100 Croatian large companies have an Internet access (79 per cent large companies in G7), while even 65 per cent of companies without Internet access plan to connect on it in next 6 months. The main reasons for not having the Internet access are: large expenses, lack of knowledge and security. More than a half (49) of companies with Internet access have the Web sites, and 36 per cent of the companies without the Web sites plan to publish it in the next 6 months, while 48 per cent of them will do it in the next 12 months. Their main reasons for not having the Web sites are: the lack of the top-management support, the insufficient resources, high costs of developing the Internet technology and selling of products or services unsuited for e-commerce.

The probability that the firm will establish Web site is connected with the level of transition, the top-management support and the firm's revenue. Rather small percent of the firms have business on-line probably because most of them rely on traditional channels. Most of the companies Web sites are still oriented toward customer communication and pre-sale support.

Most large Croatian companies have recognise the number of benefits and the importance of the Internet and the World Wide Web, but conservative attitude toward on-line business is still evident on their Web sites. Recent emerging business conditions require management to conduct fast and continuous change of organisational structure. Soon, the company managers would have to consider how to use the possibilities of the Web to become concurrent and achieve bigger competitive advantage.

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