

Competitive advantages of ICT in large enterprises modern business

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Abstract—Price reduction of computers and related equipment in recent period has enabled the purchase of the same for the broadest range of businesses regardless of size. The next logical step, which still continues, is to maximize the effects of applied information technology on the competitive position of the entity or company profits. Processed data and quality information usage in the global environment is more important than ever, and economy covered with crises is exploring opportunities for additional savings apart from the wish for more stable market position.

Transparent market challenges especially in the context of European Union are requiring additional thoughts on the use of computer technology with greater efficiency. Although rare, remaining, successful large enterprises in the Republic of Croatia realize in particular the potential which provides the optimum use of ICT in everyday communication, debts collection, resolving internal organization, market research and other business processes.

The paper theoretically shows the greatest effects and trends of ICT impact on large business entities abroad. On the other hand, empirically, the authors have conducted an empirical study on the 106 large enterprises in Croatia, which employ more than 250 employees, exploring the relationship between importance and use, as well as the impact of ICT in business results. Research hypothesis has been set regarding that theme and the results are expected to show a positive link between the impacts of ICT on company results.

Keywords—technology enhanced business excellence, competitive advantage, ICT in business, ERP, technology security and adaptability.

I. Introduction

It has been a long time since everyday usage of information and communications technology has become a standard in the business environment. Computer literacy as a term became shorter since “computer” in it has no sense in being there. Basic ICT knowledge is obligatory when we talk about general “literacy” of modern professionals, regardless of activity.

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Optimum use of resources has become imperative for companies operating in a time of global crisis. ICT is recognized as a catalyst and the media through which the entities are able to reach desired result in easier, faster way and at lower costs.

Perfect joint operation of enterprise management and IT usage is deciding on market and competitive advantage. It requires continuous improvement of information skills within and across organizational levels, determination, or the formation of origin, contents, forms processing and presentation of relevant information according to needs, and finally their processing, mediation and coordination. (Ziegenbein; 2008, p. 169)

II. Enterprise Resource Planning (ERP)

Business processes digitization possibilities recognition and implementation of information technology has provided conclusion about its market potentials. In wider use there has been established acronym ERP, which means enterprise resource planning in the broadest sense. By definition it is a set of business applications or modules, which connects the different business units of an organization such as finance, accounting, manufacturing and human resources closely integrated into a single system with a common platform for the flow of information throughout the entire business. (Behesheti; 2006, p. 184).

During the 2012th the ERP world market recorded a slight increase of 2.2%, but the short-term estimates say that its total value during the 2015th year should reach \$ 51 billion. Some of the major world leaders in the field of ERP systems are shown in Figure 1.

Worldwide ERP Software Market Share, 2012
Market Size: \$24.5B; 2.2% Growth Over 2011

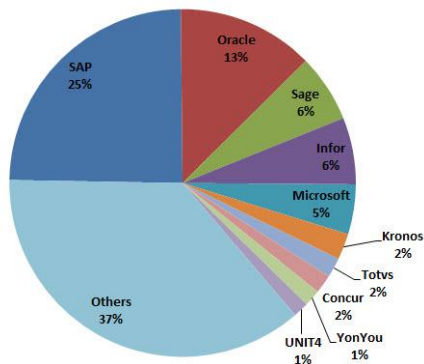


Figure 1. ERP Software market share and its main leaders
(<http://tinyurl.com/imr2014>)

Conditions on the Croatian market in terms of the ERP system is currently in an unenviable position, since more than 70% of the investment in these systems stems from standardized maintenance licenses and modules (ex. lease or a simple upgrade of existing equipment). It is estimated that the domestic ERP market will reach up to 266 million Kuna's in year 2017¹. Interestingly, SAP is largest share holding company (as well as on the world stage), followed by Microsoft, IN2 and other local businesses with a few percent of market share.

Trends of ERP systems and business information systems in general are focused on solutions in cloud (Velte; 2010). "SaaS" as a form of business in the cloud is allowing company to avoid the difficulty of initial investment in software, gaining scalability (the ability to enlarge resources easily), ongoing support and easy access. In some sense it's about renting an ERP system². Precisely because of these advantages subjects opt for this type of ERP system implementation, but clearly, there are certain challenges that pessimists like to point out.

Most important challenge of ERP system usage in this way is security since the company's data is on the server that is not under its direct jurisdiction as well as equipment is not physically located in the premises of the company. The theoretical possibility of manipulating business data entity is the subject of the efforts in trying to regulate a variety of laws or bilateral agreements. The company responsible for the development and implementation of an ERP system really has no interest to make mistakes or fraud data because their clients are on (mostly) monthly payments. Considering elastic offer of other solutions, companies can quickly move on competition. However, the safety challenge remains since data is constantly available via the Internet and thus has a pose of risk (Shabeeb; 2012.).

There's no universal solution for which ERP system to choose. Choice depends on numerous elements, financial possibilities, desired process that will follow, number of departments that will be covered, etc. Simple instructions would be to find a solution that will be generating accurate and timely information for managerial decision in order to increase organization's competitiveness.

III. Conducted research

Empirical study was conducted with the main goal of defining the potential importance of ICT application in business and its dependence on the company success. Because of the confidentiality reasons, it was not possible to know which specific ERP or enterprise IT system is used by entity and therefore, for the purposes of research four business information system characteristics were defined; quality of protection, system quality in general, the ability to monitor the process through the system and the quality of competitive information that system provides.

As a basic set for the research there were large companies identified, except financial institutions (banks, insurance companies, investment and pension funds ...), as well as public and local utility companies³. Also, another condition was that in company's main market is some sort of competitive struggle, either on the basis of domestic competition, or imported products. Selected model is simplified, one-dimensional criteria for identifying the basic set - the minimum average number of 250 employees in the year of the survey. The study was conducted in the second half of the 2012th year. From the research were excluded all companies with opened bankruptcy or liquidation during the 2012th and later. The study finally included 318 respondents.

Questionnaire was the main instrument for data collection in this research which was sent to CEOs and presidents of the Board of all companies that have constituted the basic set. The survey was conducted via e-mail and the Internet. For this purpose research used SRCE⁴ infrastructure based on open source LimeSurvey⁵ tool for creating questionnaires.

During the research there was 106 completed questionnaires returned, which makes 33.3% of the total set and what provides the basis for relevant conclusions about the hypothesis. The collected data was processed on a personal computer with Microsoft Excel 2010 and SPSS for Windows (V.18), where available financial data for the studied companies was added.

Basic research hypothesis of this paper was as follows: *There is a positive, empirically verifiable connection on the ICT impact on Croatian companies operating results.*

³ Financial institutions and utility companies were excluded from the population, because of its specificity since the uncritical application of accepted methodologies could lead to (potentially) erroneous conclusions.

⁴ <http://www.srce.unizg.hr>, accessed 10.03.2014.

⁵ <http://www.limesurvey.org>, accessed 05.03.2014.

¹ <http://www.bug.hr/vijesti/blagi-rast-hrvatskog-erp-trzista/123752.aspx>, accessed 06.07.2014.

² <http://www.acumatica.com/products/saas-pricing>, accessed 04.07.2014.

Table I. Research results on business information system features
 (Research results (N=106))

		Information system is well protected	Information system is great	Business processes are easy to follow through info. System	It provides quality info about competition
N	V ^a	106	106	106	106
	M ^b	0	0	0	0
Mean		3,86	3,51	3,58	2,59
Median		4,00	3,00	4,00	2,00
Std. Dev. ^c		,867	,978	,827	1,031
Percentiles	25	3,00	3,00	3,00	2,00
	50	4,00	3,00	4,00	2,00
	75	4,00	4,00	4,00	3,00

a. Valid
 b. Missing
 c. Standard Deviation

Previously mentioned data security within the enterprise IT systems is extremely important, especially in segments regulated by laws. Protection of information must be provided; against unauthorized access within the enterprise and possible intrusion from the outside (Internet). Results of the study showed that 69.7% ("I agree" and "strongly agree") top manager believes that the company has quality protected information system. Although a high percentage, the results show that more than 30% of companies believe that their system is not sufficiently protected. This result shows that the top managers of companies themselves perceived quality problem of the information system, or initiate it as one of the possible weak points in enterprise. On the question about IT system quality company's top managers gave the following answers shown in next figure.

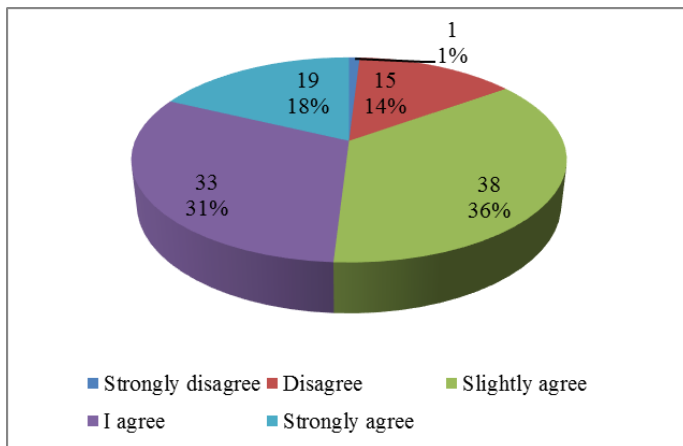


Figure 2. IT system feature – System is great (Research results (N=106))

Since this kind of answers were expected there was endeavor to define more precisely how business processes are followed.

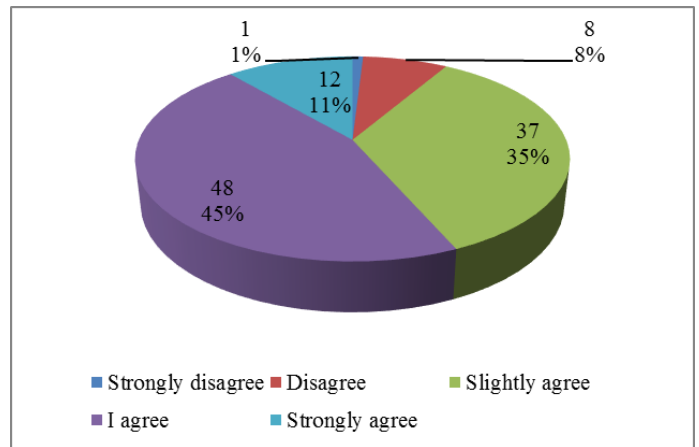


Figure 3. IT system feature – Business processes are easily followed (Research results (N=106))

Question on the monitoring of business processes has yielded about the same results as the one about system quality. Therefore, the study made a step forward, asking the top managers to score their ICT systems in a sense of providing enterprise-quality information about the competition. The results are shown in the following figure.

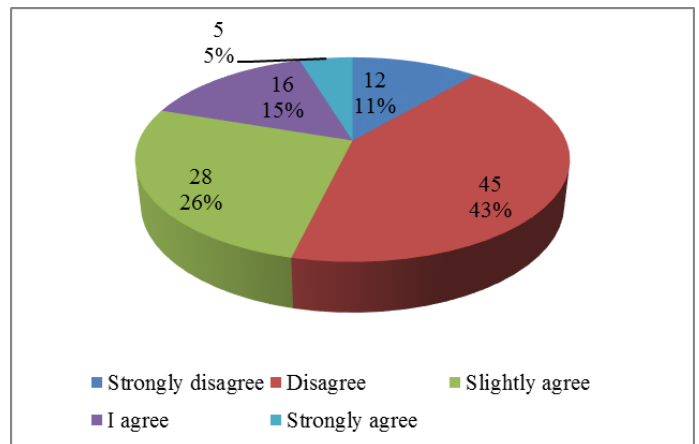


Figure 4: IT system feature – It provides quality info about competition (Research results (N=106))

Less than 20% of companies ("I agree", "strongly agree") believe that their system provides high-quality information about the competition, while the remaining more than 80% of the companies are declaring that system does not provide such information or allows it partially.

In order to measure the correlation between ICT and results of operations, it is necessary to determine whether the characteristics of the information system are affecting competitive position and whether top managers of large Croatian companies are considering information system as improvement in their competitive position on market.

Table II. Overlapping characteristics of the information system and competitive position rate and organizational changes
 Source: Research results (N=106)

Spearman's rho	Competitive position perception	Change in ICT	Org ^b . changes	
ICT quality	CC ^a	,314**	,697**	,403**
	Sig. (2-tailed)	,001	,000	,000
	N	106	106	106
Easily followed business processes (through ICT)	CC ^a	,228*	,653**	,350**
	Sig. (2-tailed)	,018	,000	,000
	N	106	106	106
Quality info about competition	CC ^a	,206*	,417**	,401**
	Sig. (2-tailed)	,034	,000	,000
	N	106	106	106

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

a. Correlation Coefficient
 b. Organizational changes

Research results in previous table in regard to competitive advantage are showing:

- Between the information system quality and the perception of competitive advantage there is a positive correlation of $r = .31$ on significance level of 0.01 (99% confidence level).
- Among the means of business processes monitoring through information systems and competitive advantage perception there is a positive correlation $r = 0.23$ on significance level of 0.5 (95% confidence level).
- Between information system that provides quality information about the competition and competitive advantage perception there is a positive correlation of $r = .21$ on significance level of 0.5 (95% confidence level).

Research results in previous table in regard to organizational changes are showing:

- The correlation coefficient is ranged from 0.401 to 0.697;
- The significance of examined correlation is at level of 0.01 (99% confidence level), which is more than the required minimum of 0.05 (95% confidence level);
- All correlations are having positive signs, which means that great value gained in the ranking values of the information system follow high value on organizational changes success scale;
- Association strength between studied variables is ranged from 0.350 to 0.697, from medium to strong correlation.

- Regarding to correlation coefficients values, level of significance, positive sign and correlation strength of observed variables it can be concluded that there's a positive, statistically significant correlation, with medium to large connectivity between observed variables in all mutual overlaps.

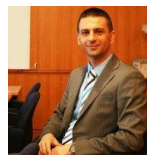
iv. Conclusion

The impact of global crisis in conjunction with the information and communication technology, especially expansion of the "cloud" solutions, provided additional incentive for even faster, more efficient and more profitable business development. Information systems driven by ERP solutions with top managers and employees able to take advantage of these benefits provide competitive advantage in the global market. Subjects prepared for such challenges will be able to survive. Research conducted on 106 large Croatian companies can conclude that there is a positive, statistically significant relationship between ICT development and results of Croatian companies. In this way, the research hypothesis was confirmed. The lack of research is that it has been done in one year so although it had provided valuable information, it couldn't provide answers to questions related to the movement of the variables in the study over a longer period of time, or a few years. Widening the scope of research together with longer time period would certainly be very interesting and presents one of the tasks for future exploring.

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 [http://goo.gl/6d1uhL]



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