The Role of Human Resource Management Practice Mediated by Knowledge Management (Study on companies from ICT sector, Croatia)

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Abstract - This paper integrates theories and findings of the role of human resources management (HRM) in the process of knowledge management (KM) in the information and communication technologies (ICT) sector in Croatia. In order to succeed, companies must prevent the loss of knowledge. Therefore, they must recognize the importance of human resources as the main factor of business. Only knowledge management enables knowledge sharing. Furthermore, applications of information technology (IT) in the field of HRM can prevent the loss of knowledge and arise the transfer of knowledge among employees. For the purpose of this paper, a survey regarding human resource and knowledge management in IT companies is conducted in order to analyze the structure of HR and the importance of knowledge sharing in an organization.

Keywords: Human resource management, Knowledge management, ICT sector

1. Introduction

Nowadays in time of increasing globalization and rapid technological advancement in the market it has become clear that companies which want to survive, should take advantage of ongoing training to equip their employees with additional skills and knowledge. When employees reach their potential, this will benefit the performance of the company. Technology is changing and IT is now omnipresent and requires new needs [12]. Products and services are characterized by short life cycles, and user’s needs have to become individualized. Namely, it is necessary to use resources up to their maximum so that companies can achieve competitive advantage. Out of all resources, the most prominent is knowledge, because it has hidden potentials and allows differentiation among competitors [20].

Market value of the company consists of visible tangible and real but invisible intangible assets. Tangible assets are machinery, buildings and equipment, while the most important intangible asset is employee's knowledge [30] but also their skills and talent that are hard for competitors to imitate, which makes them a powerful source of sustainable competitive advantage [11]. The tangible asset value decreases, while the value of intangible assets increases [10]. This is especially expressed in IT companies. Human capital is specific because it represents a unique asset. It is crucial for company development and society as a whole [14]. Consumers are no longer on the first place though employees are. It is assumed that consumers cannot be satisfied, if employees are not. Human resource management is the function with focus on planning of human resources and maintaining their motivation in order to keep the key employees in the company [5]. The importance of human resource managers is growing, which is evidenced by the fact that much more attention is turned toward their motivation and reward. One of their most important tasks is becoming how to leverage employer individual knowledge assets via knowledge sharing with the mission of creation collective knowledge resources [32].

In IT companies, employees’ knowledge has a high value comparing with other resources. Human resources are the most valuable asset to any IT companies. Human capital includes the combined knowledge, skills and creativity. ICT industry in Croatia has about 4,200 companies. Number of employees in 2012 amounted up to 31,388 employees [33]. According to these facts, we can realize the importance of ICT activities in the overall activities in Croatia. However, although there are more women than men in the world, women remain in the minority in the economy [27]. Accordingly, women represent only 30% of employees in ICT. Recent research also showed that a typical Croatian startup company founder is male (96%) [13]. Increasing the number of women in the same activity would lead to an increase of GDP in the EU [39].

“Greater gender equality in economic opportunities
contributes to stronger and more sustainable economic growth” [41].

2. Human Resources Management

The concept of HRM has the meaning of scientific discipline, management function, business function inside company and meaning of specific philosophy of management[3]. As a management function, HRM deals with recruiting, managing, developing and motivating people[28]. Conventionally, HRM function was considered by managers as a tool for dealing with employers and maintain organizational needs [26]. When we talk about human resource management as a managerial role, manager's goal is to find the best people who will be highly motivate to do their job. Furthermore, the human resource management's task is to encourage cooperation among employees in order to enhance knowledge sharing inside the company[37]. Accordingly, HRM can contribute developing of business environment, which tends to teamwork, cooperation and mutual trust. Social, economic and organizational changes have a great impact on the role of HRM in implementing strategic business objective which becoming a competitive advantage in improving organizational performance [7]. “The human resources management system must be tailored to the demands of business strategy”[1].

Strategic HR planning is an important component of strategic HR management as it allows the achievement of strategic objectives. Many researchers agree that strategic HRM has been, and remains, one of the most powerful and influential ideas that have emerged in the field of business and management [25]. Applying strategic management in the field of HRM is the most effective way to achieve competitive advantage through staff efficient and reform organization [19].

2.1. Internal and external factors influencing human resource management

Human resource management is affected by internal as well as external factors that play a major role in HRM. Management can affect only internal facts unlike external which are out of reach for management [9]. External factors that reflect on the human resource management are primarily economic system, institutional conditions, technology, culture, society and the labor market. The labor market is an external factor that is associated with the recruitment and selection of employees, and sets labor costs [3]. Internal factors that have the most direct impact on the role of HR in an organization, includes organizational culture, organizational climate, work organization, management style, staff/management relations, etc. [5]. The philosophy of management determines the relationship with employees. Companies’ size is a factor that has influence on the HRM, because in small companies this function is usually ran by owners. Being aware of an organization’s culture is important because the culture defines organizational behaviour [12]. Type of business has also influence on HRM because if activity is more challenging, there is a need for more advanced human resource management, and therefore the selection and development are more problematic. IT activity is a complex activity, so recruitment and selection of employees is not simple[3]. As an external factor of IT companies, technology has the highest influence. Comparing with others, IT companies are more related to technological developments, so they must continually implement technological achievements. Because technological uncertainty is large, that becomes very difficult [9]. The external factors have an important role in determining the opportunities that a company’s faces. Consequently, the HR managers have an important role because they have to be sure that the company take into consideration the external factors [40].

3. KM

The 21st century has been declared as a century of knowledge in which knowledge and new ideas are the main source of economic growth. New business practices have developed new kinds of workers, with new and different skills [42]. „Knowledge management has a goal of optimally usage of existing knowledge, developing and implementing to the new products, processes and business areas“[20]. Whereby the knowledge is organized and can be shared among employers. It is important to connect employers in order to facilitate knowledge sharing[16]. Several different tasks of knowledge management can differentiated, such as: development, acquisition and transfer of knowledge. Knowledge management enables company’s optimum utilization of knowledge[35]. Recent researches show that companies should be aware that paying attention to knowledge management and to intangible assets (knowledge, skills, talent of employers) may help create and develop its core competences that will lead to the competitive advantage on the market[36].

Companies that select a knowledge-based management apply knowledge for competitive
purposes, innovation and through it increase productivity. It is necessary in those companies to define specific management policy [12]. Awareness of the importance of knowledge is growing. In his research North [20] concluded that the awareness of the importance of knowledge management has been developed, and a growing number of companies already make orientation towards KM.

4. The importance of knowledge management and the impact on the HRM

“Knowledge is agglomerate of facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a certain subject”[38]. Knowledge emphasizes human resources. While the new knowledge arises by exchange of existing knowledge among employees[34]. In their research study, Özbdağ and Esenb[23] showed importance of the role of human resource management in fostering knowledge capability, which leads to more innovation in companies.

Management and transfer of knowledge are becoming more and more important aspects of modern society, because new knowledge is helping to rebuild the forms of production [16]. Knowledge is one way of differentiation of companies. It grows when it is shared and gets the value when it is used. Unused knowledge does not bring added value for companies[20]. Knowledge becomes important for the company when it is available, and its value increases with respect to its availability[37]. Knowledge transfer depends on the characteristics of knowledge that is transferred, the source of knowledge and the recipient [5].

Knowledge sharing in the IT companies is very important. Through team working, IT companies can more flexibly adapt and react to complex and dynamic environments change [2]. They form project teams where employers have different roles. Therefore, some teams consist from business analyst, programmers, testers, etc. Such approach allows better communication and easier detection of potential problems in all phases of software production[21]. This process is very important in IT companies because finding possible errors greatly reduces the cost of correcting them. In the IT companies, employment is often carried out from a remote location and therefore virtual teams have become popular. Usually, team members are people from different countries and cultures. Therefore, knowledge sharing in virtual teams is much harder than sharing knowledge inside the company[21]. On the other hand, working in teams does not mean that team members will not work independently. Task independency also requires a flow of information and a high level of knowledge sharing. This would indicate appropriate organisational structure or use of adequate technology to support the codification, storage, organisation, and retrieval of knowledge [4].

Employees should be observed as investors of their own knowledge. Accordingly, they decide if they want to invest their knowledge in company or not. Therefore, it is important that companies take a stand through which will motivate employees and encourage their knowledge investments [24].

Employers are afraid of losing key people because they would lose knowledge as well. If this knowledge is not shared with other employees, it can cause huge losses for company[12]. HR managers can motivate employees to share their knowledge among other employees, and not that there are look each other as a competition. Also, human resource management can act on the barriers present in knowledge transfer [17]. Mediation of human resource management with knowledge management can be seen from the following definition: “a series of interconnected activities of the organization and management focused on the strategy and tactics of human capital and the development of knowledge, skills and competencies of employees in general, know-how, through education and training, gain work and professional experience.” [35].

Strengthening the connection between knowledge management, human resource management and organizational development is main criteria for achieving [18].

HRM can contribute to the knowledge sharing by different techniques. By encouraging teamwork, participation of employee, job rotation, a high-level of training, etc. [34]. Readiness to share knowledge and being cooperative will have a large role in the business success. Therefore, employee’s motivation to work in teams is very important[20].

A lot of research paper have identified ICT as one of the critical factors for enhancing KM [22]. Information technology can be helpful in knowledge managing. ICT are technologies, which facilitate the management to share knowledge and information [29]. It cannot be applied to all aspects of knowledge management, but IT can support in way of online directories, search the knowledge base, access to information about past events, etc. [8]. Accordingly, IT can increase speed of creating and transmitting knowledge. Explicit knowledge can be stored and
transferred by ICT resources through video conferences and various communication tools [20].

4.1. Previous research regarding HRM and KM

Empirical research [31] about the knowledge sharing among employees has occurred to the following conclusions: gender does not influence on the cooperation and teamwork; employees with more years of employment have greater desire for cooperation; employees of higher qualifications are more willing to cooperate compared to those in small companies. Human resource management can influence to increase ability of receiving knowledge through job analysis, selection, employment, further education and evaluation. Furthermore, it can influence to increase motivation by reward and promotion [17].

Research made by Monteiro and Cardoso [18] shows a correlation between training as an educational investment and formal knowledge management practices. Strategic management affects the practice of knowledge management. Organizational orientation to knowledge is significantly associated with informal knowledge management.

Research [35] conducted in the large Croatian companies showed that Croatia has poorly developed practice of knowledge management (11.8% activities related to information and communication). Among others, this is evidenced by the following: 33.3% of companies in the 2006 sent more than 50% of their employees to further education, 20.6% of companies required from employees to transfer knowledge from conferences, workshops, etc., 21.9% of companies conducted practice of meeting after the project finished with the aim of transferring knowledge, 38.7% companies in which employees usually share their knowledge among other employees, 23.5% of companies using software for KM, 40.6% of companies use information technology to create a knowledge base. Further, studies have shown that 82.4% of the companies have person responsible for the knowledge management in the department of human resources. One positive finding was that 65.6% of companies have used information technology to document with the aim of transferring knowledge. According to research results [16] of knowledge management and application of information technology, companies are given the highest score for the statement that the information tools enable efficient operation and the information tools have been useful for data storing about suppliers and customers. The lowest grade was given for the statement that IT is used for group work.

4.2. Research hypotheses

With the research study, the authors wanted to find out the importance of sharing knowledge in the IT companies, and its connection with the human resource management. In addition, the authors wanted to find out what are the goals and motivations of employers in the IT sector. After extensive literature review and analysis of available materials four hypotheses were created:

**H1. The number of women employed in the IT companies does not exceed 30% of the total workforce.**

European Commission data show that the share of women in the last few years reduced and that men make even 4/5 of the ICT industry [39]. In accordance with the problems related to the small percentage of women in the IT sector with the first hypothesis the authors wanted to investigate if the women also represent only 30% of employees in ICT sector in Croatia, more precisely in Zagreb County and the City of Zagreb.

**H2. IT companies with defined processes of knowledge sharing reward employee for good performance.**

Rewarding increases employee motivation with the aim of improving its performance. Rewards are used as a tool for encouraging employee behavior to work in the interests of the company. Therefore, the rewards are also used for encouraging knowledge sharing among employees [6].

**H3. IT companies that invest in the employee’s education have developed a system of sharing knowledge.**

Education is important for knowledge sharing. Whereby the acquired knowledge can be shared at formal and informal gatherings [6].

**H4. There is a positive attitude towards knowledge sharing in IT companies.**

Teamwork is a specific for IT companies because employees in teams work on specific projects. To achieve a common project goal, employees must be complementary to each other according to their skills and they have to share their knowledge to each other.
5. Methodology

For research purposes online survey questionnaire, with 23 questions, was created using Google Docs tool as a measuring instrument for collecting data. In the questionnaire, mostly closed-response questions were used. Except for demographic data, respondents either rated statements on a scale from 1 to 5, or responded to multiple-choice questions. Questionnaire was sent on the e-mail addresses of IT companies who have more than a five employees and registered in the Zagreb County and the City of Zagreb. E-mail addresses were collected from the Business Register of the Croatian Chamber of Commerce (CCC). The survey, which was conducted in the period from 20 March to 16 April of 2014, was sent to 282 company e-mail addresses. Companies were selected according to their main code area activity information and communication under the code J582 Software publishing, J62 Computer programming, consultancy and related activities and J63 Information service activities.

In total, we collected 37 questionnaires, or 13% of the total respondents. A sample of 37 companies is representative as it contains all the features of population from which the sample was taken. Collected data were analysed using Microsoft Excel and statistical tool SPSS Statistics. The collected data were interpreted using descriptive statistics. The method of deduction and generalizations were adopted for certain conclusions.

The expected scientific contribution is reflected in the fact that there are relatively few work paper, especially in domestic literature, which are exploring mediation of human resources and knowledge management. Therefore, conducted research can contribute to a better understanding of the importance of human resource and knowledge sharing among employees with the aim of being more competitive in the market.

6. Research results

Considering the average number of employees, companies are classified as small, medium and large according to the Accounting Act. Small businesses have up to 50 employees, medium up to 250, and large over 250 employees. However, apart from the average number of employees, the data were taken for total assets and profit. Since conducted survey questionnaire was anonymous, company size was defined by the criteria of the average number of employees. In the research study 84% small businesses and 16% medium and large business participated.

About 35% directors, while other correspondents were human resource managers, secretaries, IT managers and heads of finance department. Of all respondents, 57% were male. In 81% of companies, for human resources management are responsible directors or managers. The rest of the companies have formed a Department of Human Resources Management. Analysis of individual results showed that there is no rule that company with more employees has the Department of the HRM. For example, a company with 25 employees has a department of the HRM; on the other hand, in the company with 125 employees, executive manager is also responsible for managing human resources.

\[ H1. \] The number of women employed in the IT companies does not exceed 30% of the total workforce.

According to the results of the questionnaire, the total number of employees is 1,171 of whom 277 are women. Accordingly, the percentage of women in IT companies is 24%. Based on the result, the hypothesis H1 can be accepted. Confirmed by the fact that even in the Zagreb County and the City of Zagreb percentage of women employed in IT does not exceed 30%.

On the question regarding average age of women in IT, 60% of companies responded that the average age of women is from 31 to 40 years. The 26% of companies responded that in their company the most common age of women is from 20 to 30 years, while other companies have said that the average age of women is from 41 to 50 years. It is interesting that none of companies have responded that the average age of women is 51 years and older. Furthermore, the research results showed that in 97% of companies’ women and men have the same opportunities for employment. Therefore, a small percentage of women in IT can be the reason of inadequate competence or a small number of women who graduated in IT. Correlations between skills have shown that the most important skills are analytical skills and creativity for which Pearson's coefficient is 0.669.

\[ H2. \] IT companies with defined processes of knowledge sharing, reward employees for good performance.

Correlation between defined processes of knowledge sharing and reward system for sharing knowledge, give the result of Pearson's coefficient 0.837. This result indicates a very good correlation of observed variables.
According to the results of the chi-square test (Table 1) connection reward system for knowledge sharing in accordance with defined processes for knowledge sharing, it could be noticed that there is a statistically significant difference ($\chi^2 = 32.757; df = 8; p = 0.000$). Companies, which have defined processes of knowledge sharing, tend to have developed reward system for knowledge sharing. For companies that have defined processes of knowledge sharing is characterized:

- Supports the data exchange, exchange of information and knowledge among organizational units (0.540)
- A rewards and punishments system is clearly defined (0.636)
- Evaluation system has a purpose that employees seek the same goal (0.527)
- The needs of education are determined by performance evaluation (0.532)

**H3. IT companies that invest in the employee’s education have developed a system of sharing knowledge.**

Results of chi-square test (Table 2) show that there is no statistically significant correlation between investment in education and development of the system for knowledge sharing ($\chi^2 = 2.731; df = 2 \quad p = 0.255$). About 16% of IT companies do not invest in the education of employees on the annual basis, but have a developed system of knowledge sharing, while 62.2% of IT companies invest in employees training and have developed system of knowledge sharing. However, according to the results of the chi-square test (p = 0.255) the hypothesis H3 is rejected because companies which, invest in education of their employees, do not necessarily developed a system of knowledge sharing.
H4. There is a positive attitude towards knowledge sharing in IT companies.

T-test was used to test the attitude of companies for knowledge sharing. The authors' wanted to see if the attitude towards knowledge sharing in IT companies is positive. Answers are positive if the company responded with "I agree" or "Strongly agree" (share of the average value is greater than 60% and the coefficient of significance is less than 0.05). Company’s’ opinion is neutral if \( p > 0.05 \) and the respondents opinion is negatively if they answered, "Disagree" or "Strongly disagree" (share of the average value is less than 60% and the coefficient of significance is less than 0.05).

| Table 3: T-test - test attitude towards knowledge sharing in IT companies |
|-------------------|-----|-----------------|------|---------|
|                   | N   | Mean            | The share of the average value | t-test | Sig. (2-tailed) |
| During the selection process, priority is given to employees who are prone to sharing knowledge. | 37  | 4.135           | 82.7 | 30.600  | 0.000         |
| Your company promotes co-operation and exchange of experience. | 37  | 4.649           | 92.98| 48.117  | 0.000         |
| Your company promotes a reward system for knowledge sharing. | 37  | 3.108           | 62.16| 17.186  | 0.000         |
| The grading system has a strong impact on individuals and team behaviour. | 37  | 3.486           | 69.72| 27.608  | 0.000         |
| During the process of problem solving, all team members have the same opportunity to share their opinions and ideas. | 37  | 4.622           | 92.44| 57.177  | 0.000         |
| There are defined processes of sharing knowledge among employees in your company. | 37  | 3.541           | 70.82| 22.430  | 0.000         |

The table 3 shows the average values for each variable, and the proportion of their average value. In addition, it shows the value of t-test and significance coefficient (0.000). The total average value is 3.924 (78.48%) which is higher than 60% and the coefficient of significance is less 0.05; 78.48% belongs to the answer "I agree". Thus, there is a positive attitude towards knowledge sharing in IT companies, and therefore we accept the hypothesis H4.

Discussion and conclusion

Looking at the results of this study, we do not neglect the fact there are some shortcomings of the research. The disadvantages are related to the number of surveyed companies that is 37 of the 282 sent e-mails (60 e-mails are not delivered). Accordingly, the percentage of companies (Zagreb County and Zagreb City) that responded to the questionnaire is 13.12%. In addition, questionnaires were sent only to registered companies in the Zagreb County and Zagreb City. Considering the number of IT companies that responded to the study and the total number of IT companies in Croatia, this research covered just 6.8% of the IT companies from whole Croatia. The data about the number of IT companies are based on the information gathered from the website Business Register of the Croatian Chamber of Commerce (CCC). In addition, one limitation of the study is the subjectivity of respondents that may be affected by misunderstanding of questions, purposely gave distorted response and disinterest for the research. Furthermore, the limitations of the study is also linked to the lack of earlier conducted research in Croatia which results could not be compared with the results of this study.

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