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Relation between Knowledge Management and Turnover in Slovenian Micro and Small Start-Up Organisations

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This article discusses the importance of knowledge management and employee turnover, using the example of selected Slovenian organisations, in particular, technology parks. The purpose of this article is to point out statistical characteristics between employee turnover and certain selected independent variables. The empirical research was conducted on a population of 667 Slovenian organisations gathered from the subjects of an innovative environment database, and a further sample of 51 chosen technology parks from the A group. By implementing multivariate regression analysis, we sought to examine whether knowledge requirements and knowledge transfer paths in these organisations have a statistically significant influence on employee turnover. The aim of this article is to present the results of empirical research that defines the development of a conceptual framework for understanding the influence of knowledge management on employee turnover. The results have shown that the importance of intellectual and social capital, intangible capital assets and their continuous measurement must be acknowledged within an organisation.

Key words: employee turnover, knowledge management, organisation, employees

1 Introduction

Recently, the business environment has witnessed the development of a relatively large number of industrial clusters and other business networks, which combine knowledge organisations that promote the creation of business information and knowledge exchange (summarised according to Porter, 2000; Brinkley, 2006; Parise, 2007). According to the definitions of some authors (Argyris, 1998; Devinney et al., 2005), knowledge has become the force that gives a competitive advantage to an organisation. At the same time the organisation must employ all mechanisms (e.g. the establishment of a corporate culture) that enable utilisation of internal and external organisational knowledge in everyday business activities. In their research, Prusak and Cohen (2001) stress the crucial role of meaning and evaluation of knowledge management (KM) in organisations. They evaluate KM from the perspective of human resources theory and from the importance of intellectual capital in the emergence, growth and development of an organisational perspective. As a fast growing discipline,

KM is becoming increasingly important for organisations oriented towards maximising efficiency, innovativeness and, in consequence, competitiveness (summarised according to Rowley, 1999; Davenport and Prusak, 2000). It should also be emphasised that the importance of the development and understanding of KM, has also been on the increase (Drucker, 1994; Leonard-Barton, 1998; Teece, 1998). The reason for this can be found mainly in the recognition of knowledge as the foundation for competitiveness and as a key to business success (Nonaka and Takeuchi, 1995; Pemberton and Stonehouse, 2000; Rebecca et al., 2009).

Based on empirical results, this article gives a basic view of the interlinking, influence on and importance of evaluating KM for employee turnover in selected organisations that are members of Slovenian technology parks. André (2008) views science-technology parks as centres of scientific-technological development, with a purpose that includes not only research in the laboratory sense but also the transfer of results into practice and the commercialisation of products or services (also known as a modern way of acquiring new technological

knowledge and consolidating what has been already acquired). Alavi and Leidner (2001) draw attention to the occurrence of science-technology parks of the third generation, which represent an infrastructure for the establishment and development of knowledge-based organisations, which can be found at locations connected with technology centres of excellence (usually universities). From an organisational point of view, a technology park is an isolated “mini city”, which started to grow somewhere on the outskirts of a city or on the ruins of older industries. Thus, a technology park can be part of a university, a multinational corporation or individual interested companies.

The final aim of the article is to present empirical findings from data that have been statistically processed in advance and that define the development of a conceptual framework for understanding the influence of KM (as an independent variable) on employee turnover (as a dependent variable). It was recognised that, if an organisation wants to function properly, the importance of intellectual and social capital, intangible capital assets and their continuous measurement must be acknowledged within an organisation.

2 Theoretical background

Sustainable development and increased uncertainty in the business environment are forcing dynamic technological organisations to invest in technology and knowledge of employees. For technological micro and small organisations innovation and the intuition of employees can be perceived as the critical success factors (Kuula et al., 2012). An organisation can safeguard its success by providing appropriate business processes, with a tendency towards innovativeness, technological solution search and market needs. One therefore needs to be aware of the importance of knowledge and the creation of a suitable relationship with employees that will work towards the common good. Joint success will be guaranteed if both the organisation and the employees are aware of the importance of knowledge dissemination within the entire organisation and of proper decision-making on the basis of available information.

2.1 Social capital as a bond between individuals and the organisation

According to some authors (Adler and Kwon, 2002; Inkpen and Tsang, 2005; Rebelo and Gomes, 2011), social capital is composed of human and intellectual capital, and is based upon the networking of individuals and staff as a whole. This assumption was confirmed by Drucker (2004), who states that management staff must acquire as much information as possible for its work from the external environment. Additionally, Kotler (2004) emphasises that much of the information acquired by managers originates from outside the organisation, that is to say from business partners, customers and colleagues, as well as state, financial and other institutions. At the same time Cohen and Prusak (2001) emphasise that social capital can be viewed as a state of active connections among people. On this basis, it can be concluded that, compared to

a group of individuals, social capital has a greater influence on the growth and success of an organisation. Freeze and Kulkarni (2007) conclude that social capital promotes norms of mutuality, facilitates information flow and, on the basis of former cooperation, enables access to data on the credit status and reputation of stakeholders. Our further research was based on several prior theoretical and empirical starting points on the importance of KM and the phenomenon of employee turnover in an organisation, made by various authors (Zemke et al., 2000; Mathis and Jackson, 2004; Bierly and Daly, 2007; Chatterji, 2009; Phillips and Edwards, 2008).

2.2 Organisation and knowledge management

According to the views of some authors (Bollinger and Smith, 2001; Dess et al., 2001; Kujansivu, 2009), today's organisations must be able to react to challenges in the business environment with a clear vision of how to ensure competitiveness, which involves the entire staff at all organisational levels. Alvesson and Karreman (2001) define KM and processes related to knowledge as part of the organisational activities that stem from information systems, organisational sciences, international business and economy. A knowledge organisation thus encompasses a broad spectrum of processes and techniques, with the help of which it generates, connects, selectively divides and effectively uses knowledge through various processes (Carrion-Cepeda, 2006; Reychev and Weisberg, 2006).

According to Becker (2001), knowledge organisations combine their top information technology with highly educated staff that is capable of realising the intended innovation policy of the organisation. On this point, Jarrar (2002) states that this is organisation management with a salient orientation towards knowledge or KM. Additionally, Schein (2010) points out that an organisation obtains new knowledge on the basis of strategic sources. Marshall et al. (1996) understand KM as a process through which we attempt to determine what kind of human capital is embodied in those individuals to which a larger group of individuals – one that is responsible for the development of the organisation – has access to. McElroy (2003) points out that the process of knowledge formation includes individual and group learning, the definition of which knowledge is necessary and information gathering. We can sum up that the purpose of KM is the creation, accumulation and transformation of individual knowledge into organisational knowledge, which is used in business processes (Thierauf and Hocht, 2006; Fuentes et al., 2007; Armstrong, 2009).

2.3 Organisation and the importance of employee turnover

Armstrong (2009) defines turnover in connection with employee satisfaction in the workplace and the sense of belonging to the organisation. In general, it can be understood as the final (permanent) departure of employees from the organisation. It appears when an employee leaves the organisation and has to be replaced. On the basis of the above, it can be defined as a rate for measuring employee departure from the organisation.

A higher rate value can be disturbing for an organisation and is associated with higher costs arising from the replacement of departing employees with new ones (Schermerhorn et al., 2002). However, when talking about the phenomenon of positive turnover – an unsuccessful and unsuitable employee leaves the organisation – it can be said that such turnover is good and healthy for an organisation (Dalton et al., 1981). The organisation replaces such employees and gains new co-workers with fresh knowledge, new ideas and creativity (Phillips and Edwards, 2008). Franca and Lobnikar (2008) estimate that an employee turnover rate of up to 5% is necessary in an organisation, a rate of up to 7% is normal, and a rate of up to 10% worrying. Tavi and Tollington (2008) are of the opinion that the desired employee turnover rate is lower in organisations that prefer the internal labour market and life-long employment.

3 Conceptual research framework

3.1 Research orientation

The research concept was based on measuring processes of KM in Slovenian micro and small start-up organisations that are members of Slovenian technology parks. On the basis of a previously prepared survey questionnaire (Roblek, 2011), we sought data on how organisations acquire knowledge, how much knowledge can be found in organisations, what type of knowledge can be found and how the knowledge is created, transformed, transferred and stored. Thus we analysed the staff potential of organisations, with the aim of establishing how knowledge influences employment and staff development. We concentrated on the evaluation of respondents regarding KM processes, to find out how KM influences the efficiency of organisations in Slovenian technology parks in general. The respondents were Slovenian micro and small organisations, and that factor plays an important role in the implementation of KM. Larger organisations have already set up an established organisational structure, whereas in smaller organisations this structure is insufficient. We came to the conclusion that the organisational culture plays a vital role in the implementation of KM processes.

3.2 Purpose of the article and research question

The purpose of this article is to describe the influence of KM factors on employee turnover in selected Slovenian technology parks, on the basis of empirical research conducted in 2011. The study was conducted using a survey questionnaire on a population of 667 Slovenian business entities, gathered from the subjects of an innovative environment database maintained by the Public Agency of the Republic of Slovenia for Entrepreneurship and Foreign Investments (JAPTI). On a sample of 51 technology parks from the A group, we sought a connection between the dependent variable (employee turnover in organisations that are members of technology parks) and selected independent variables. Using multivariate regression

analysis, we wanted to examine whether KM has a statistically significant influence on employee turnover. The aim of this article is to present results of the empirical research that define the development of a conceptual framework for understanding the influence of knowledge management on employee turnover. In the research three basic hypotheses were set as a starting point and were used to test the basic research question, that is, whether KM has a statistically significant influence on employee turnover: 1 – various KM factors are crucial for the long-term existence and success of an organisation; 2 – connectedness and the influence of knowledge creativity factors, knowledge accumulation and individual knowledge transformation are basic factors for activities and success within an organisation; 3 – the data acquired by the questionnaire is accurate, and on this basis the hypotheses can be verified or rejected. In the following part of the article, the data collection methodology and subsequent statistical processing are described.

4 Methodology

4.1 Data collection

The empirical data was collected by an online survey questionnaire. The link to the questionnaire was sent to 519 email addresses. The questionnaire was composed of seven blocks of close-ended and open-ended questions relating to the field of knowledge management. The first five blocks were related to KM processes: 1 – environment: development of the organisational culture in connection to KM and the organisational system in individual organisations; 2 – requirements: knowledge requirements in an organisation; 3 – resources: most valuable resources and knowledge; 4 – knowledge development: knowledge forms within an organisation; 5 – knowledge transfer paths.

The questionnaire on KM processes was composed of approximately 21 questions, for which the respondents were asked to indicate their agreement on an ordinal scale. Closed-ended questions were measured using a four-point Likert Scale to see to which degree respondents agreed or disagreed with the proposed statements (1 – strongly agree, 2 – agree, 3 – disagree, 4 – strongly disagree). The sixth block was intended for questions on employee turnover and absenteeism in an organisation. In the seventh block respondents were asked about their demographic characteristics. Before the questionnaire was finally approved, a pilot test was conducted on eight members of the Technology Park in Pomurje. After the testing, the question on knowledge requirements, from the additional question block, as well as the demographic data were supplemented.

4.2 Population and Research Sample

The basic empirical research sample comprised 667 organisations which are members or associated members of Slovenian technology parks and university incubators, kept in the JAPTI database under group A. Invitations were not sent to 148

addresses for the following reasons: 1 – the organisation is a member of a larger technology park; 2 – the organisation does not have an email address; 3 – the organisation has neither a homepage nor an email address. Additionally, we received 51 email responses, in which the respondents explained that they would not participate in our survey for the following reasons: 1 – the content of the questionnaire does not appeal to them; 2 – the organisation has withdrawn from the technology park; 3 – lack of time for answering. On this basis we can assume that other respondents may have ignored the questionnaire for similar reasons. We would like to point out that the survey was conducted among micro and small organisations with fewer employees, who for this reason have to bear a greater burden at work. This is why the response percentage is lower in this segment than it would have been in medium-sized or large organisations. Kuan (2005) also addresses the problem of fewer responses on the part of small organisations. Fifty-one questionnaires were adequately completed and returned; this means that the final response rate amounted to 9.84%. Sixty-eight questionnaires were inadequately completed and were eliminated (more than 15% of answers were missing).

4.3 Statistical Data Processing

The basic overview of the survey results has been processed and presented on the basis of descriptive statistics (tables, graphs). All hypotheses have been tested at a significant rate, which was smaller than 5% ($P=0,05$). The reliability of the questionnaire was tested with Cronbach's alpha, which represents a reliability or consistency coefficient. Furthermore, we have processed the acquired empirical data with the statistical analysis programme SPSS. Using the "Enter Multivariate Regression Analysis", we have analysed the relation between the dependent variable and selected independent variables. The dependent variable is the employee turnover in organisations that are members of technology parks. On the basis of the given independent variables in the questionnaire, we have selected those that have the greatest influence on the emergence of and increase in the social capital rate. Table 1 presents values of the Cronbach's alpha coefficient for items related to the individual parts of the survey questionnaire.

We can see that the Cronbach's alpha value ranges from 0.496 for items concerning knowledge transfer paths to 0.816 for items concerning knowledge requirements. Based on these data, we can conclude that the reliability of the questionnaire is high. Except for the alpha value concerning knowledge transfer paths, which is below the level of 0.60, all other alpha values are above the acceptability level and reach values over 0.80: knowledge requirements (0.816). In what follows, we present individual empirical findings of the study, which have been processed with adequate statistical methods.

5 Correlation between knowledge management and employee turnover

5.1 Description of the organisations studied

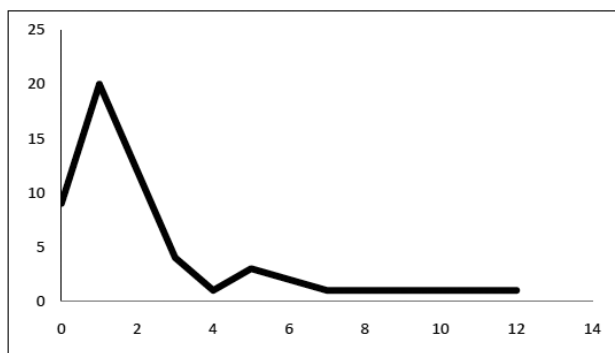
In the studied Slovenian technology parks, on average more than two thirds of employees have a pre-Bologna university education. Based on the membership and the organisations' activity structure, we assume that most of the members are performing high technology activities that demand educated staff. The average age of the respondents varies between 26 and 60 years (average age is 34). This relatively young population can be connected to the fact that new organisations are being established in incubators and technology parks, especially by students, young graduates and researchers. In the collected empirical data collected we include relatively holistic data on an organisation's activity structure. It was found, that in one-fifth of all cases, information technology is predominant, followed by research and development as well as services. The purpose of the collected data is twofold: on the one hand, to determine the size of the organisations studied, and on the other hand, to calculate the turnover rate in these organisations. Figure 1 depicts the number of employees and their turnover in these organisations from the time of their establishment to 31. 12. 2010.

Based on data concerning the number of employees, we found that our sample comprised micro-organisations, which employ less than 10 employees, and small organisations with less than 50 employees. One-third of the organisations had no

Table 1: Description of variables

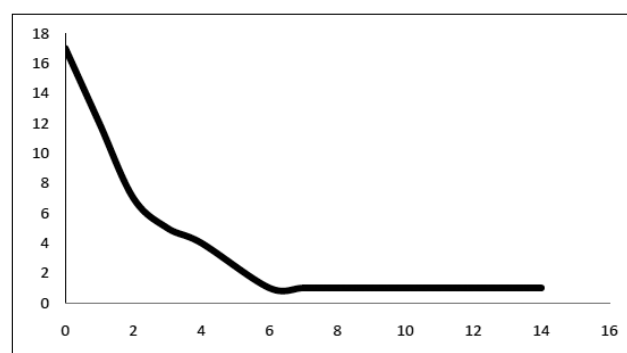
Items	Cronbach's alpha	Cronbach's alpha, based on standardised items	N of items
Business environment	0.609	0.624	7
Knowledge requirements	0.816	0.819	14
Value of resources	0.681	0.67	10
Knowledge acquisition	0.767	0.783	14
Knowledge transfer paths	0.496	0.512	10

Source: Authors' own



x – number of employees at the time of establishment
y – number of organisations

Source: authors' own



x – number of new employees at the time of its establishment until 31.12.2010
y – number of organisations

Figure 1: Number of employees in the organisations studied

employees at the time of establishment; less than two quarters had one employee; just over one-fifth had two employees, etc. Furthermore, one-third of these organisations hired no employees after the establishment; in just over one-fifth of cases they hired from 1 to 4 employees. During the research period, in most cases no employee had stopped working for the organisation; in other organisations where this was the case, the number was negligible.

5.2 Importance of KM for the development of small and medium-sized organisations

For calculating the reliability or consistency of the coefficient, we used the “Cronbach’s alpha” method. This is used to determine how well a group of variables or items measures an individual one-dimensional latent structure. A “Cronbach’s alpha” value over 0.70 is suitable for determining further internal consistency. Based on the questionnaire results, we have calculated that the “Cronbach’s alpha” value varies from 0.496

for items concerning knowledge transfers to 0.816 for questions concerning knowledge requirements. We can conclude that the reliability of the questionnaire is high, since all alpha values are above the acceptability level (0.70). Therefore, we can also conclude that knowledge requirements have a statistically typical influence on KM.

Results

The hypotheses were tested with the “enter” regression method, which includes all the variables and evaluates the regression coefficients for all independent variables simultaneously (Kazmier, 2004).

Hypothesis testing 1: The demand for knowledge has a statistically significant influence on turnover in technology parks.

In our case the corrected coefficient of the explained variance (R^2) is 48.4%. The percentage of the explained variance is 51.3%, and this means that the dependent variable is rela-

Table 2: Display regression coefficients – requirements for knowledge

Independent variables	Unstandardized coefficients		Standardized coefficients	t statistics	sig
	B	St. error	Beta		
Technology influence	-0.623	0.337	-0.469	-1.841	0.000
Human influence	-0.625	0.41	-0.521	-1.522	0.000
R2 = 48.4% F = 84.06 p < 0.01					

Source: Authors' own

Table 3: Display regression coefficients – requirements for knowledge acquisition

Independent variables	Unstandardized coefficients		Standardized coefficients	t statistics	sig
	B	St. error	Beta		
Communicatiopn technology	0,107	0,386	0,312	1,251	0,003
Ability of personnel acces to information resources	0,111	0,872	0,41	1,429	0,000
R2 = 49,56% F = 76,34 p < 0,01					

Source: Authors' own

tively well explained by the selected independent variables. With the help of F statistics, we tested the whole regression model and in this way measured or validated the meaningfulness of the model as a whole. We got $F = 84.06$. Based on this, we can assume that this is a good model that adapts to the data and that it is statistically typical. The influence of the independent variables is also statistically typical. From the standardised regression coefficients, we can conclude that the employees' easy approach to information resources, whether inside or outside the organisation, has the biggest influence on the phenomenon (rate) of turnover. We can therefore conclude that human factor has a statistically significant influence on turnover in small and medium-sized organisations that are members of Slovenian technology parks. An increase of independent variables reduces turnover.

Hypothesis 2: The acquisition of knowledge has a statistically significant impact on social capital in small and medium-sized organisations, members of the Slovenian Technology Parks.

In our case the corrected coefficient of the explained variance (R^2) concerning the importance and impact of social capital is 49.56%. The share of the explained variance is 49.56%, and this means that the dependent variable is relatively well explained by the selected independent variables. With the help of F statistics, we tested the whole regression model and validated the meaningfulness of the model as a whole ($F = 76.34$). Based on this, we can assume that this is a good model that adapts to the data and that it is also statistically typical. The impact of both independent variables is statically significant, the standardized regression coefficients and shows that the level of social capital largely affects allow personnel access to information sources, both inside and outside the organisation. Increasing the independent variables increase the level of social capital.

Employee turnover

Based on the calculation of turnover rate, we classified the respondents in 4 groups: 1 – from 0 to 25; 2 – from 26 to 50;

3 – from 51 to 75; 4 – from 76 to 100 percents of turnover. We found that the majority of organisations have a turnover rate between 0 and 25 percent. These relatively high turnover rates can be explained by the fact that these are micro-organisations, which are founded by self-employed persons who can change their status by retaining the status of director of one organisation, while at the same time being long-term employed in another organisation (economics, science, education etc.). The organisations state different reasons behind the occurrence of turnover: 1 – voluntary resignation of employees; 2 – termination because goals were not reached; 3 – retirement; 4 – conflicting interests of employees and the organisation; 5 – expiry of employment contract; 6 – lack of financial resources. Moreover, we established that absenteeism is not a disruptive factor in the functioning of micro-organisations that are members of Slovenian technology parks. Only 9.8 percent of respondents drew attention to this problem. The main reason stated was sick leave on account of a child's illness. This can be connected to the fact that these organisations do not have a large number of employees and that they mostly employ relatively young people, without family obligations related to absenteeism. We can conclude that these organisations different approaches and types of formation, information, planning, transfer and storage of knowledge are being used. We assume that these processes influence knowledge management within the organisations.

6 Final findings

The main purpose of this article was to present empirical data on the importance and the influence of KM on employees of organisations that are members of Slovenian technology parks concerning creativity, innovation and job satisfaction. These are resources that Nonaka et al. (2000) define as specific to an organisation and of utmost importance for the creation of value on an individual organisation. In this empirical study we attempted to define the development of a conceptual framework for understanding the influence of KM on employee turnover in organisations. We had previously studied the theo-

retical framework and acquainted ourselves with the starting points of various authors who had defined KM processes and the influence of employee turnover. We focused especially on the positive and negative causes of employee turnover that influence the work habits of employees.

We collected empirical data based on a questionnaire completed by 51 micro- and small organisations that are members of Slovenian technology parks. We found that better provision and management of knowledge do lead to better performance and consequently to a greater employee satisfaction. Therefore, we can assume that KM has a typically positive influence on turnover in micro- and small organisations that are members of Slovenian technology parks. Furthermore, we analysed the influence of independent variables (1 – influence of technology and human influence (KM); 2 – internal and external influences) on the dependent variable (employee turnover) with the help of the multivariate regression method. We found that there is a statistical correlation between the dependent and independent variables.

Similarly, research on the importance of knowledge management for start-up companies is also carried out in Austria. The results of the Austrian study are mentioned here in order to compare them with the findings of our study. Tangemann et al. (2010) in the study of business-academic incubators in Austria came to the conclusion that the incubated start-up organisations an average age of 2.5 years and create 1.323 jobs. Seventy-two per cent of all jobs created are filled by highly educated staff (university degree), which indicates how intense they are in the field of knowledge creation. An analysis on average annual growth rates showed that two-thirds of all incubated start-up organisations achieved growth, 13% of organisations have more than doubled the number of employees per year, 29% of all organisations stagnated and only 5% reduced the number of employees (Tangemann et al., 2010).

On the basis of the results gathered, we can conclusively report that networking of individuals as well as of organisations with the purpose of increasing processing in the form of knowledge transfer is crucial for both the organisations in general and Slovenian technology parks to function successfully. The data and findings are valid only for the sample used for this research. Nonetheless, they can be extended and used on a population with comparable characteristics.

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