

The Influence of Intellectual Capital Over a Company's Value Added

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Abstract Today intellectual capital is one of the most discussed concepts among scientists, managers and even the public. Intellectual capital and its influence is quite a new subject that has not been studied well. This paper examines the influence of intellectual capital over the value added of a company. The company's value added also plays a vital role in modern society, in particular in the country's economy.

Keywords – Intellectual capital, company's value added, human capital, structural capital, customer capital.

I. INTRODUCTION

Every company tries to be strong and find the appropriate place for business. Managers attempt to search for innovations and new technologies in order to increase the company's value added. It is considered that there is a relation between company's intellectual capital and company's value added, but this process is still under investigation by scientists [1, 2, 7, 10, 11, 13, 14] In addition, intellectual capital is not a simple and solid material. It is composed of three main parts – human capital, structural capital and customer capital. However, other components of intellectual capital are separated out by different researches: Van Buren (1999) identifies human capital, innovation capital, process capital, customer capital [21]; O'Donnell and O'Regan (2000) - human, internal structure, external structure [11]; Edvinsson and Malone (1997) – just human capital and structural capital [7]. That is why **the problem** arises – how to evaluate the influence of intellectual capital over for company's value added? It is not easy to describe and characterise intellectual capital and its components. **The object** of this paper is the intellectual capital's influence over a company's value added. **The aim** of this paper is to analyse the influence of intellectual capital over company's value added in Lithuania. **The objectives of the article are as follows:**

- 1) to reveal the main theoretical and practical aspects of the topic;
- 2) to analyse company's value added in Lithuania;
- 3) to evaluate intellectual capital as a factor of the increase of company's value added.

Methods of research: comparative analysis of scientific literature, statistical analysis.

II. INTELLECTUAL CAPITAL THEORY

The theory of intellectual capital is quite long and complicated. On the one hand, scientists describe intellectual capital as a value created by human capital (W. Petty, XVII c.), on the other hand, more components and descriptions of intellectual capital are found. Adam Smith in his book "Wealth of Nations" (1776), while investigating the distribution of employees' salaries, noted and emphasized the importance of employees' knowledge, learning and improvement [15]. In addition, he proved that educated and experienced workers earn much more income and that their productivity is higher. The benefit from educated and experienced employees is greater than from uneducated ones. Today scientists are trying to analyse the theory of intellectual capital, the main parts of it, its advantages and disadvantages. The main purpose of analysing intellectual capital literature is to find a relation between economic benefits and intellectual capital.

One of the best known intellectual capital researchers, Bontis (1999) proposes a number of intellectual capital descriptions and elements [2]. For instance, intellectual capital is equal to the sum of intangible assets and organisation resources. He considers that all the processes in a company, innovations, patents, contacts, tacit and explicit knowledge are also intellectual capital. Tacit knowledge is knowledge that cannot be transferred to other people and cannot be written or described. For example: learning, development, training. It is due to the fact that it is impossible to explain how a person learns or improves himself, it is hard to explain the process of learning. Explicit knowledge is knowledge that can be expressed easily, it can be coded, saved and incorporated in a special media, like computer files, compact discs, USB keys. For instance: documents, procedures, tutorials, encyclopaedias.

The Organisation for Economic Co-operation and Development – OECD (1999) also describes intellectual capital as a composition of organisational capital and human capital [12]. They attach computer systems, distribution networks and supply chains to organisational capital. Human capital is composed of clients, partners and suppliers. In addition to this, Stewart (1997) adds a third component – customer capital [16]. He describes intellectual capital as a bunch of useful knowledge. That bunch of knowledge helps a company to move ahead, helps to reduce costs and to increase

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the value added. The result is profitable and stable company which can compete with rivals and to bring benefits for the entire country.

Zéghal and Maaloul (2010) give one of the latest descriptions of intellectual capital [22]. According to them, intellectual capital is the sum of all knowledge in a company which allows to generate company's value added. It is important to mention that intellectual capital is still countless and it is hard to measure employees' capability to work. Managers can only see diplomas and certificates but sometimes they do not mean that the employee has plenty of intellectual capital with him.

In addition, it is important to analyse components of intellectual capital. Brooking (1996) divides them into a four main parts: market assets, human-centred assets, intellectual property assets and infrastructure assets [4]. Sveiby and Petrash (1996, 1997) identify three main components of intellectual capital: external structure, internal structure and human capital [18]. External structure is all the relations of clients and suppliers, internal structure is all the processes that take place in a company. Human capital, according to Sveiby and Petrash, consists of employees with their knowledge, experience, skills, values, motivation and so on.

Ramirez, Lorduy and Rojas (2007) identify three main components of intellectual capital: human capital, structural capital and relational capital [13]. Edvinsson and Malone (1997) identify also three main and quite similar parts of intellectual capital: human capital, structural capital and customer capital [7]. In this paper the structure of intellectual capital is selected according to Stewart (1997): human capital, structural capital and customer capital [16] (Table I).

TABLE I
COMPONENTS AND STRUCTURE OF INTELLECTUAL CAPITAL

INTELLECTUAL CAPITAL COMPONENTS			
	HUMAN CAPITAL	STRUCTURAL CAPITAL	CUSTOMER CAPITAL
<u>Structure</u>	Knowledge Skills Education Motivation	Legal property rights Strategy Organisational culture Organisational routine	Clients Partners Networks Distribution channels
<u>Value</u>	Increases human productivity	Codes employees' knowledge	Generates company's value added
<u>Importance</u>	New ideas, technology creation	Transmission of knowledge	Link between company and client

According to Stewart (1997), *human capital* is everyone that leaves a company on weekends. Human capital is employees' knowledge, education, skills, motivation. The main aim of human capital is the generation of new ideas, skills, improvements, and innovations. It is important to mention the fact, that precisely human capital increases human productivity which leads to higher income and lesser expenses.

Structural capital, according to Stewart (1997), is such knowledge that is left in a company after employees go home. They belong to a company and can be transferred, for instance: technology, documents, organisational culture and routine, legal rights, structures and systems, inventions and so on. The main value of structural capital is that it codes employees' knowledge and can be useful any time. The importance of structural capital is that there should be the transmission of knowledge in order to work steady and be well-established.

The most important part of intellectual capital is *customer capital*. According to Stewart (1997), it is essential for a normal company's activity. Customer capital is full of bonds, links and connections with clients, partners, and suppliers. The main value of customer capital is that it generates a company's value added. Without a client there would not be any business. That is why the importance of customer capital is the link between company and client.

To sum up, intellectual capital and its theory is quite new and modern concept which is very useful for companies and the generation of value added. Intellectual capital is the sum of three main components: human capital, structural capital, customer capital. Intellectual capital helps a company to generate its value added. That is why it is important to investigate the relationship between intellectual capital and a company's value added.

III. RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL AND A COMPANY'S VALUE ADDED

Intellectual capital relation with a company's value added is under investigation. A number of scientists are conducting studies and are trying to find the answers to the most important questions related to intellectual capital and a company's value added.

Zéghal and Maaloul (2010) carried out a research on intellectual capital and a company's value added [22]. They investigated how intellectual capital with its factors affects three main areas in a company: economic activity, financial activity and stock market indicators. This research revealed that there is a significant relation between intellectual capital and economic activity, intellectual capital and financial activity, intellectual capital and stock market indicators. Intellectual capital increases company's value added and reduces production costs.

Sullivan (2000) emphasizes the importance of knowledge and information. He indicates that many successful companies nowadays are trying to convert their tangible assets into intangible: knowledge and information [17]. Nowadays a lot of products and services have intangible value for consumer, for instance: a modern car has powerful computers that regulate many functions such as engine performance, navigation, conditioner etc. In addition, mobile phones, personal computers, credit cards, even children toys are smarter than ever before. Sullivan (2000) introduces a new form of a company – the so-called knowledge company. It is a company that converts its knowledge into a value and because of this earns high income. Examples are worldwide known companies that generate large cash flows such as

IBM, Microsoft, 3M. These companies are mainly based on knowledge or intellectual capital.

Pew Tan and Plowman (2007) also emphasise that intellectual capital is essential for the creation of a company's value added [19]. They carried out a scientific research that has revealed that intellectual capital and a company's value added correlate positively. It means that intellectual capital increases a company's value added.

Cabrilo and others (2009) carried out an empirical research into intellectual capital's components and a company's value added [5]. They examined which elements of intellectual capital parts mostly affect company's value added. The structure of intellectual capital was human capital, structural capital and relational capital. The survey was conducted at various companies of Serbia in order to find elements that strongly affect company's success and value added. There were given such human capital elements such as employees' effectiveness, experience, education, motivation, competency and others. For structural capital: cooperation between workers, trademarks, D&R (development and research), databases, organisational culture and others. For relational capital: prestige, reputation, relations with clients, partners, suppliers, mass media, shareholders, banks and other financial institutions, competitors and others. The survey results have revealed that the main factors for human capital that influence a company's value added are employees' effectiveness, experience and motivation. The main factors for structural capital were cooperation between workers, informational technologies and process management. The main factors for relational capital: relations with clients (even 92 percent frequency), prestige and relations with suppliers. In addition, these elements play a vital role in every company's activity and they are essential for a normal and stable company's existence.

To sum up, works by many researchers have revealed that intellectual capital is a very important factor for any company, its value added and its stability. That is why it is important to analyse Lithuanian companies' value added and to find out what are the main parts and elements of intellectual capital that mostly affect a company's value added and its success.

IV. THE ANALYSIS OF SMALL AND MEDIUM-SIZED BUSINESS VALUE ADDED IN LITHUANIA

Small and medium-sized business creates the main part of Gross Domestic Product (GDP) in Lithuania. Because of the economic crisis in 2008 the number of operating entities in Lithuania has decreased sharply (Table II).

TABLE II
NUMBER OF OPERATING ENTITIES IN LITHUANIA IN 2007 – 2010

	2007	2008	2009	2010
Number	76 516	81 376	84 574	83 201

Source: Department of Statistics to the Government of the Republic of Lithuania

Table II shows that the number of operating entities was growing from 2007 to 2009 (from 76516 to 84574 operating entities). Due to the crisis at the beginning of 2010 there were 1373 less companies – only 83201 operating entities in Lithuania.

In addition to this, Table III shows the number of small and medium-sized companies in Lithuania (Table III).

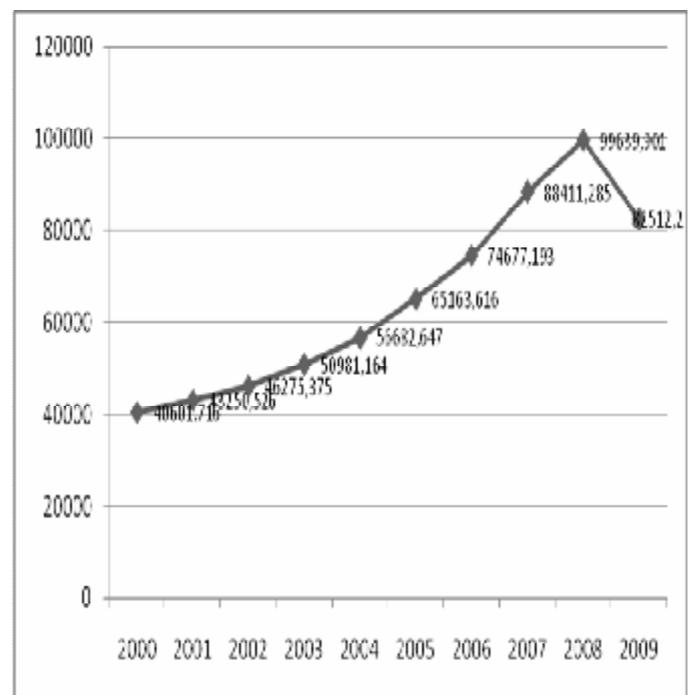
TABLE III
NUMBER OF SMALL AND MEDIUM-SIZED COMPANIES IN LITHUANIA IN 2007 – 2010

	2007	2008	2009	2010
Number	59 712	63 187	65 232	63 447

Source: Department of Statistics to the Government of the Republic of Lithuania

Table III shows that the number of small and medium-sized companies was increasing from 2007 to 2009. But at the beginning of 2010 there were only 63447 small and medium-sized companies in Lithuania. They account for as much as 76.3% of all operating entities in Lithuania and create the major part of Lithuania's GDP.

In addition, small and medium-sized companies create a major part of gross value added in Lithuania. Although the economic crisis impoverished the activity of companies in all economic sectors, but small and medium-sized companies still play a significant role in a weary economy. Figure 1 shows gross value added in Lithuania (Fig. 1).

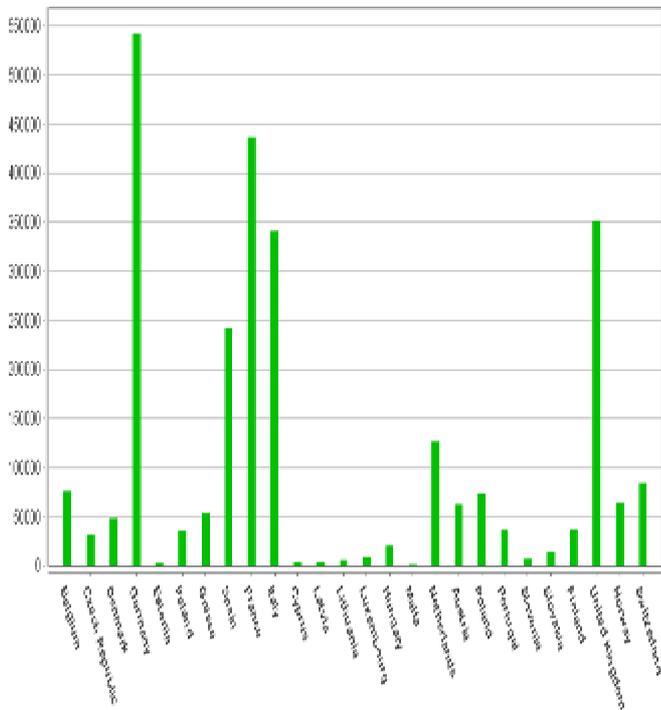


Source: prepared in accordance with the Department of Statistics to the Government of the Republic of Lithuania

Fig. 1. Gross value added at current prices in 2007 – 2010

Figure 1 shows that from 2000 till 2008 the gross value added was increasing, but at the end of 2009 it sharply decreased to LTL 82,512,280 million. This resulted from the economic crisis and labour force depression, reduction of

profits and foreign investments. In addition, the main part of value added makes companies working in trade, hotels and restaurants, transport, storage and communication sectors. The greatest value added loss was recorded for companies working in a construction sector. This creates a big problem. Figure 2 shows gross value added created by European countries.



Source: Eurostat

Fig. 2. Gross value added in European countries, EUR million

It is obvious (Fig. 2) that the highest value added is in Germany (EUR 542380 million), France (EUR 436689 million), and United Kingdom (EUR 351291.4 million).. Lithuania by gross value added is only at the 22nd place among 26 countries (EUR 5980.5 million).

To sum up, the main part of Lithuania's GDP and gross value added is created small and medium-sized companies. Still this share is very small compared with other European countries. It is essential to analyse intellectual capital's influence over Lithuanian companies' value added.

V. RESULTS OF A RESEARCH

In April – July 2010, a survey of Lithuanian small and medium-sized companies was conducted. The subject of analysis was how intellectual capital affects company's value added and which elements mostly increase a company's value added. 428 representatives of small and medium-sized businesses were surveyed. Companies were selected randomly. A sample of respondents was measured according to formula (Eq. 1):

$$n = \frac{1}{\Delta^2 + \frac{1}{N}}, \quad (1)$$

where: n – sample when error probability P=0,95

N – general population

Δ – allowable size of sample error (Δ = 0,05)

The sum of respondents according to the formula (Eq. 1) was nearly 400 (Eq. 2).

$$n = \frac{1}{0,05^2 + \frac{1}{83201}} = \sim 480 \quad (2)$$

A model of intellectual capital influence over a company's value added was created in order to investigate the relationship between the main factors of intellectual capital and value added (Fig. 3).

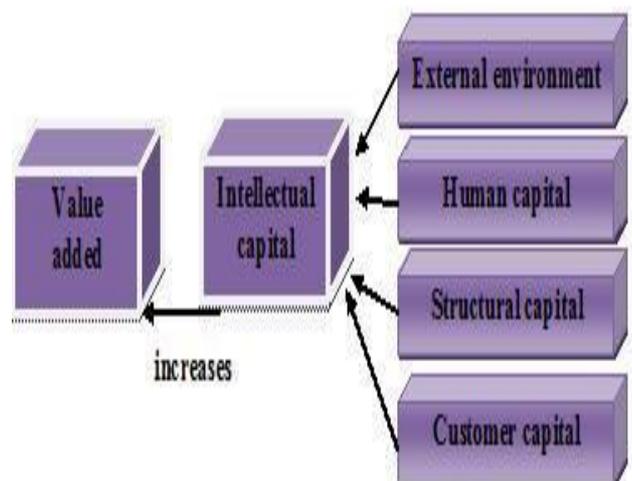


Fig. 3. Model of intellectual capital's influence over a company's value added

The model (Fig. 3) reveals that four main aspects affect intellectual capital: external environment, human capital, structural capital and customer capital. If one part increases it causes intellectual capital's increase. On the other hand, intellectual capital increases company's value added.

Figure 4 shows that the structure of respondents was as follows: 31.4% representatives of small enterprises, 25.6% – of medium-sized enterprises, 25,6% - of micro enterprises and 17.39% – of large enterprises.

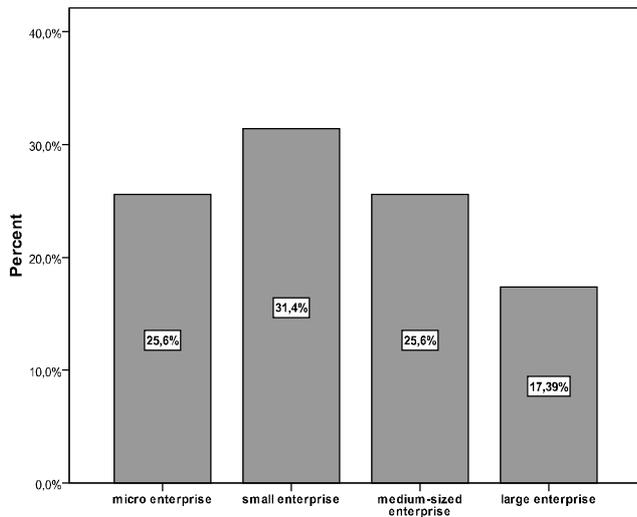


Fig. 4. The distribution of respondents by a size of enterprise

In order to find out which resources are most important, respondents were asked to assign a score to resources (financial resources, material resources, immaterial resources, human resources, organisational resources, informational resources or resources based on relations) in the Likert scale from 1 to 7 (1 – less important, 7 – most important). Figure 5 (Fig. 5) shows that in Lithuanian companies financial resources are most important resources today (mean – 6). Human resources are on the second place (mean – 5,07). It is quite strange and it reveals that Lithuanian companies still do not realise the importance of intellectual capital and of human resources.

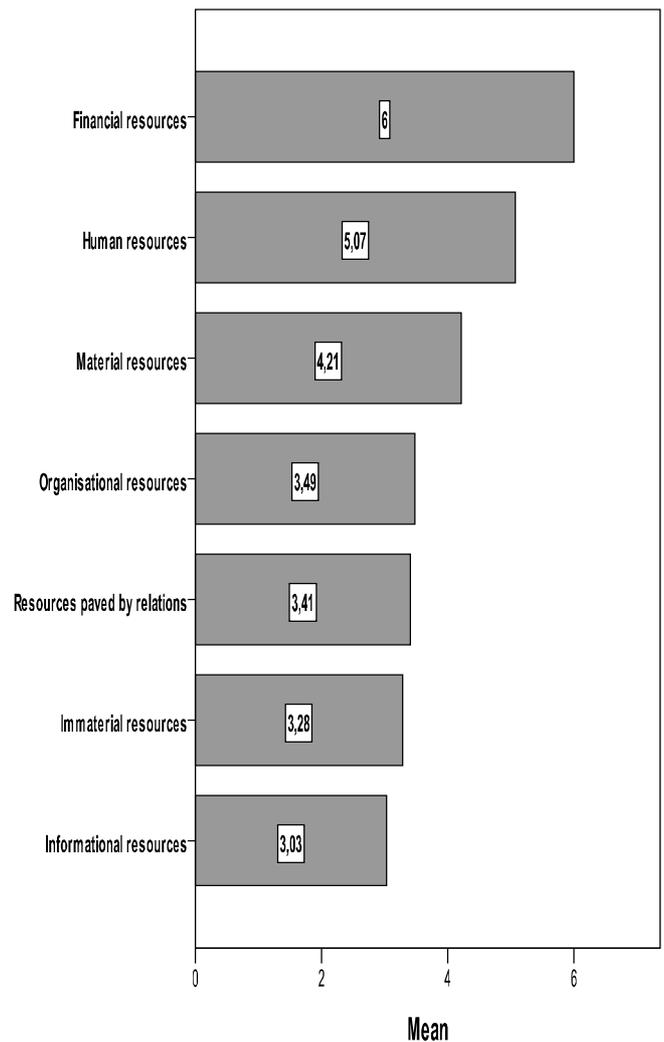


Fig. 5. The importance of different types of resources

According to the model of intellectual capital's influence over a company's value added, it is necessary to analyse which of the intellectual capital's elements are most important for the increase of a company's value added. Figure 6 shows (that human capital is the most important (mean – 3,87). Customer capital and structural capital, however, are very important too (means – 3,7991 and 3,6927). The significance of these numbers in the Likert scale is "important".

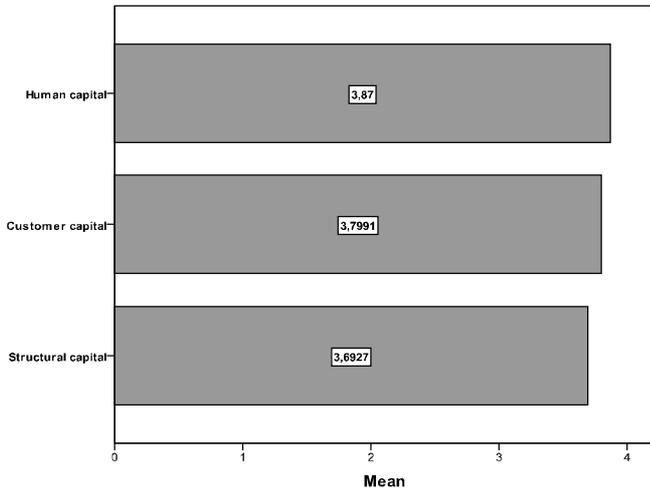


Fig. 6. The importance of intellectual capital's components for company's value added

In order to find out which elements of intellectual capital mostly affect a company's value added, respondents were asked to grade them in the Likert scale from 1 to 5 (1 – less important, 5 – most important). The results are given in the Figure 7 (Fig. 7). The most important for a company's value added are manager competency (mean – 4,395), customer relations (mean – 4,128) and prestige (mean – 4,102).

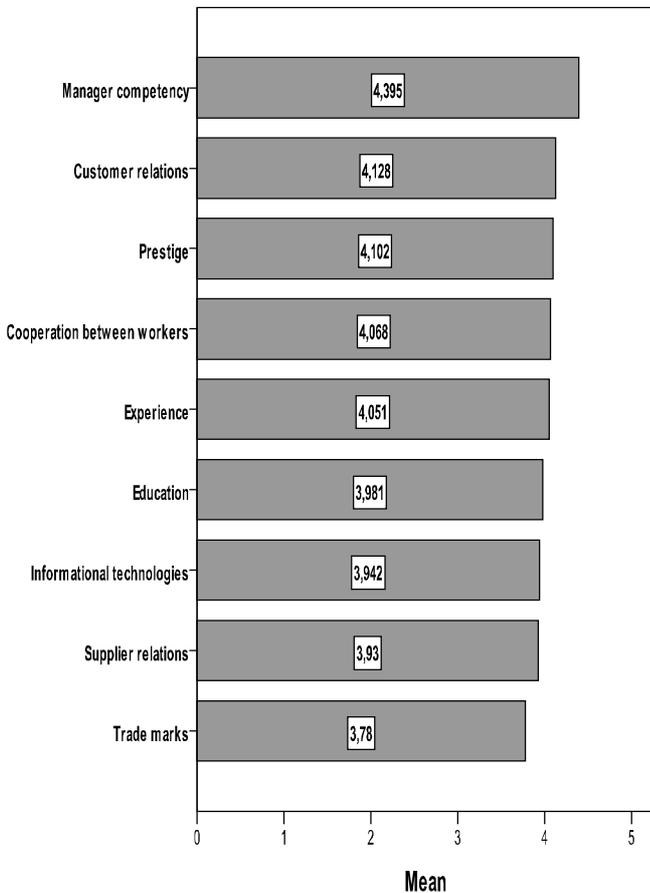


Fig. 7. The importance of intellectual capital factors for a company's value added

The same factors were given for respondents in order to evaluate the importance of intellectual capital itself. The results are given in Figure 8.

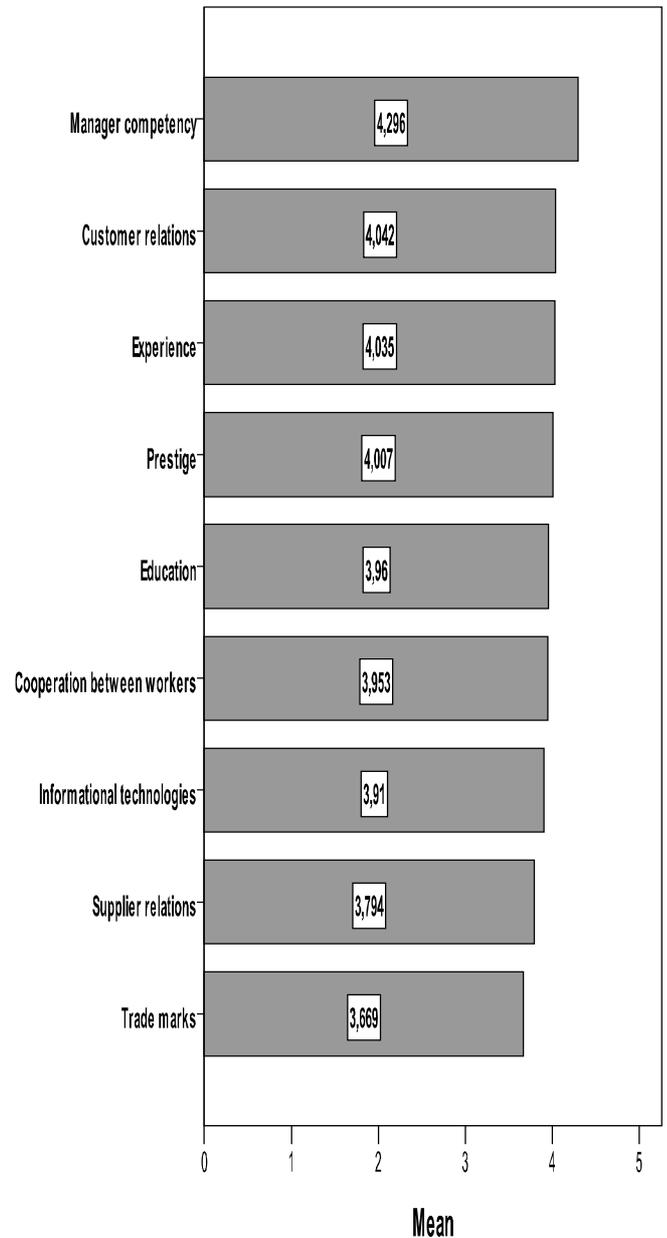


Fig. 8. The importance of intellectual capital factors for intellectual capital itself

The results (Fig. 8) revealed that the most important factors for intellectual capital include managers' competency (mean – 4,296), customer relations (4,042) and employees' experience (mean – 4,035). In addition, it is important to divide these factors into components of intellectual capital:

1. Human capital – manager competency (mean – 4,296); employees' experience (mean – 4,035); education (mean – 3,96).
2. Structural capital – cooperation between workers (mean – 3,953);

informational technologies (mean – 3,91);
trade marks (mean – 3,669).

3. Customer capital –
customer relations (mean – 4,042);
prestige (mean – 4,007);
supplier relations (mean – 3,794).

The survey revealed that Lithuanian companies do not understand the importance of intellectual capital as a factor of a company's value added. It is important to mention that education was rated only at the 5th place although it should be on the 1st place. In addition, managers realise that human capital, structural capital and customer capital play a vital role in the creation of value added.

VI. CONCLUSIONS

Intellectual capital is a new modern concept that is very useful and has a number of advantages. Scientists describe it as a set of useful knowledge and emphasise the importance of education, knowledge, skills, experience, relations between customers, partners, financial institutions and competitors. Intellectual capital is a combination of three main components: human capital, structural capital and customer capital.

Small and medium-sized businesses create the major part of Lithuania's GDP and gross value added. But the problem is obvious – the gross value added is very small compared with European countries. That is why the survey was carried out and the results have shown that Lithuanian companies and managers still do not understand the importance of human resources, intellectual capital and its components. It is recommended to continue the research and the proposal could be a system of learning and training for managers and employees.

It is important to know the fact that intellectual capital is at the centre of a company's value added and managers should pay attention to this.

VII. REFERENCES

- [1] Biddle C. G. et al. Economic value added: some empirical evidence, *Managerial finance*, Vol. 24, Nr. 11, 1998, pp. 60 – 71.
- [2] Bontis N. et al. Intellectual capital and business performance in the pharmaceutical sector of Jordan, *Management decision*, Vol. 48, Nr. 1, 2010, pp. 105 – 131, ISSN 0025-1747.
- [3] Bontis N. Intellectual capital: an exploratory study that develops measures and models, *Management decision*, Vol. 36, Nr. 2, 1998, pp. 63 – 76, ISSN 0025-1747.
- [4] Brooking A. Intellectual capital, 1996, A Thomson Company, London.
- [5] Cabrilo S. et al. Researching indicators of organizational intellectual capital in Serbia, *Journal of intellectual capital*, Vol. 10, Nr. 4, 2009, pp. 573 – 587, ISSN 1469-1930.
- [6] Chaharbaghi K., Cripps S. Intellectual capital: direction, not blind faith, *Journal of intellectual capital*, Vol. 7, Nr. 1, 2006, pp. 29 – 42, ISSN 1469-1930.
- [7] Edvinsson L., Malone M. S. Intellectual capital: realizing your company's true value by finding its hidden brainpower, 1997, Harper Business, New York.

[8] Mouritsen J. Driving growth: economic value added versus intellectual capital, *Management accounting research*, Nr. 9, 1998, pp. 461 – 482.

[9] Mouritsen J. Problematising intellectual capital research: ostensive versus performative IC, *Accounting, auditing & accountability journal*, Vol. 19, Nr. 6, 2006, pp. 820 – 841.

[10] Nerdrum L., Erikson T. Intellectual capital: a human capital perspective, *Journal of intellectual capital*, Vol. 2, Nr. 2, 2001, pp. 127 – 135, ISSN 1469-1930.

[11] O'Donnel D. et al. Intellectual capital: a habermasian introduction, *Journal of intellectual capital*, Vol. 1, Nr. 2, 2000, pp. 187 – 200, ISSN 1469-1930.

[12] Organization for Economic Cooperation and Development (OECD), 1999, "OECD symposium on measuring and reporting of intellectual capital, Amsterdam", OECD, Paris.

[13] Ramirez Y. et al. Intellectual capital management in Spanish universities, *Journal of intellectual capital*, Vol. 8, Nr. 4, 2007, pp. 732 – 748, ISSN 1469-1930.

[14] Sharma S. R. et al. Value – added knowledge management for financial performance, *The journal of information and knowledge management systems*, Vol. 37, Nr. 4, 2007, pp. 484 – 501.

[15] Smith A. Wealth of nations, 1776, London: Methuen & Co., Ltd.

[16] Stewart T. A. Intellectual capital: the new wealth of organisations, 1997, Doubleday Dell Publishing Group: New York.

[17] Sullivan H. P. Jr, Sullivan H. P. Sr. Valuing intangibles companies. An intellectual capital approach, *Journal of intellectual capital*, Vol. 1, Nr. 4, 2000, pp. 328 – 340, ISSN 1469-1930.

[18] Sveiby K. E. The new organisational wealth: managing and measuring knowledge-based assets, 1996, Berrett-Koehler Publishers, Inc.: San Francisco.

[19] Tan H. P. et al. Intellectual capital and financial returns of companies, *Journal of intellectual capital*, Vol. 8, Nr. 1, 2007, pp. 76 – 95, ISSN 1469-1930.

[20] Tan H. P. et al. The evolving research on intellectual capital // *Journal of intellectual capital* – Vol. 9, Nr. 4, 2008, pp. 585 – 608. – ISSN 1469-1930.

[21] Van Buren M. E. A yardstick for knowledge management, *Training & Development*, May 1999, pp. 71 – 78.

[22] Zéghal D., Maaloul A. Analysing value added as an indicator of intellectual capital and its consequences on company performance, *Journal of intellectual capital*, Vol. 11, Nr. 1, 2010, pp. 39 – 60, ISSN 1469-1930.