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## **Knowledge-intensive firms: HRM focus**

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December 2009

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### ***Abstract***

This paper provides the analysis of new category of companies – knowledge-intensive firm - and new approaches to HRM. The criteria for companies' identification are discussed. These firms are analysed through intellectual capital concept. Human capital is considered as one of the criteria of knowledge-intensive firm and as the most valuable structural element of intellectual capital. Furthermore HRM model in knowledge-intensive firms is introduced and substantiated. The model considers the concept of internal labour market and divides personnel into core employees and peripheral employees. Specific human capital of core employees – their knowledge, skills and abilities - becomes the main source for organisational abilities and competitive advantages of knowledge-intensive firm. The human capital profile of a core employee is provided as the result of the pilot survey.

### ***Key words***

Knowledge-intensive firm, Intellectual capital, Human capital, Human Resource Management, Core Employees, Human Capital Profile, Abilities

## **Introduction**

The modern economy is often defined as economy of knowledge, or the economy based on knowledge by researchers and experts. It testifies that knowledge becomes the major resource of economic development. It becomes not only resource, but also the engine of economic growth and the basic source of wealth. These changes are perfectly well illustrated by T.A. Stewart with an example of beer can. Nowadays there is more knowledge than metal in a beer can, he says. (Стюарт 2007: 29). Indeed knowledge component defines the value of any product we analyze. Intelligent machine tools, personal computers, smart phones are typical examples of knowledge-intensive products, but today we are talking about such examples as knowledge-intensive footwear, clothes etc. Thus, even the traditional FMCG have become smarter lately. Expenses for the information account for three quarters of the added value of almost any product by scientists measure (Стюарт 2007: 42). Nowadays it is hard to find an organisation which is not information-intensive and does not depend on knowledge. At the same time there are some organisations which viability is defined by its intellectual capital amount.

## **Research motivation**

Researchers in management field mark fast growth of quantity of the companies based on knowledge. The new category of organisations – knowledge-intensive firms have appeared. (Edvinsson, Bontis, Sveiby, Sullivan Jr. and Sullivan Sr., Marr, Mouritsen etc). Dr Margaret Blair carried out the longitudinal study of American companies since 1978 on 1998. The results of M. Blair's research showed that 80% of the company value was tangible assets and only 20% - intangible in 1978. By 1998 this proportion has considerably changed: only 20% of corporate value was charged to assets and 80% was intangible assets. (Sullivan J., Sullivan S. 2000). These changes cause new management technologies including human resources management technologies. (Sullivan J, Sullivan S vary. 2000). It involves researchers' attention and at the same time, the growing attention of representatives from different fields of knowledge puts emphasis on the identification problem of new category of companies.

The literature analysis shows the lack of identification criteria for companies of new category. Another problem of identification concerns term translation from English into Russian. The idea of “knowledge-intensive firm”, “knowledge-based company” or “intelligent organisation” in foreign literature bases on knowledge management. In Russian literature knowledge-intensive is linked with intellectual capital concept. But at the same time there is no exact definition of the term.

## **Research questions**

Studying management features and HRM specifics of knowledge-intensive firm demands an accurate definition of research object. In other words, there is a question: what company can be carried to knowledge-intensive. What criteria to define to relate a company with new category. It is necessary to notice that there is no exact answer on this question in the literature.

The aim of this paper is to:

- Analyze the approaches to knowledge based organisation and define criteria for its identification;
- Introduce and substantiate HRM model in a knowledge-intensive firm.

### **1. The concept of Knowledge-intensive firm**

According to the social studies dictionary intelligence comes from Latin Intellectus what means “understanding” and “comprehension”. Understanding means set cognitive abilities which define the level of thinking and ability to solve difficult problems. The result of intellectual activity is the intellectual product which can include inventions, opening, patents, projects, technologies descriptions etc. If an intellectual product, actives and the property, needed for its producing, is used for profit reception it is possible to speak about capital. Thus the intellectual capital is embodied in knowledge, abilities, experience and qualification of people. In this case intellectual investments are expenses for developing experts, know-how transfer, scientific workings out, etc.

Another aspect of the definition is intensive or capacity. Capacity characterizes the internal volume or abilities to contain certain quantity of contents. For example, energy intensive production is defined as production with a high share of expenses for fuel and energy in cumulative costs. Another example is a capital-intensive good. It is a product that requires a high level of financial assets investments. Thus, knowledge-intensive firms can be defined through concepts of intellectual capital and intensive or capacity, i.e. it is a company with a high share of intellectual investments and a high share of the intellectual capital in product or service cost.

In Russian practice knowledge-intensive firms are considered as high technology companies very often. In this case High-tech production is characterized by high costs on R&D in general cost proportion. At the same time high-tech companies and knowledge-intensive firms have not identical meaning. The key element for a high technology company is research and development, and as for knowledge-intensive firm the key element is intellectual capital which includes not only investments into research activity, but also the human and social capital.

There are several definitions for companies of a new category in the English-speaking literature: “knowledge-intensive firms”, “knowledge-based companies”, and “intelligent organisations”. The role of knowledge in product and service delivering, developing dynamic capabilities and creating corporate strategy is considered as a key aspect for both knowledge-intensive firms and knowledge-based companies. (Alvesson 1993; Davis and Botkin 1994; Drucker 1988; Nurmi 1998; Starbuck 1992; Zack 2003). Describing a knowledge-based company M. Zak underlines that it is more important how the processes are organised, then what company actually produce. It is important to analyze the role of knowledge in production process and how knowledge management is supplied. (Zack 2003). For example, it seems obvious at first sight that a research institute or a consulting company is a knowledge-intensive firm and a cement manufacture is not. However the deep analysis of knowledge management in each company is required for the correct identification of a knowledge-intensive firm. Knowledge-management as the key aspect of knowledge-intensive firm is also considered by E.A.Naumova who underlines the role of new knowledge creation and transfer.

Using the definition “intelligent organisation” researchers underline the role of organisation understanding. It means how organisation understands its environment, products and services, and also competitors and development possibilities in future (Dayyani 2009: 974). Thus, the main focus while defining “knowledge-intensive firms”, “knowledge-based companies” and “intelligent organisations” is considered as knowledge management but not intellectual capital management that we suppose as a wider concept.

## **2. Identifying Knowledge-intensive firm through Intellectual capital**

The theoretical analysis reveals various approaches to definition of knowledge-intensive firm. From the individual level of the analysis a knowledge-intensive firm may be defined by creativity, ability to innovations, loyalty, and motivation of its employees. From the organisational level of the analysis a knowledge-intensive firm may be defined by value structure or by value of the intellectual capital for company’s success. Considering the research goal we adhere to organisational level of the analysis. Thus knowledge-intensive firm should be defined through some economic indicators and measurement of intellectual capital in cumulative value of the company. For further research steps the intellectual capital concept need to be analysed.

There are several approaches for defining intellectual capital. A number of researchers consider intellectual capital as a difference between market value and fundamental value of the company. (Edvinsson and Malone 1997, Stewart 1997, Sveiby 1997, Mouritsen et al, 2001). Another approach describes intellectual capital as a business reputation or goodwill. In this case

goodwill is defined as intangible assets. (Ohlson 1995, Feltham and Ohlson 1996, Beaver 1998, Holthausen and Watts, 2001)

Literature analysis provides several definitions connected with intangible assets. Ambiguity of understanding arises concerning goodwill, intangible assets and intellectual capital. It seems the concept of the intellectual capital arising in 1990th is agreed with the intangible assets concept. The reasons of developing the concept of intellectual capital are described in paper Prosvirina I.I. (Просвирина И.И. 2004). The terms used for accounting system intangible assets, brand, goodwill and intellectual property did not cover the whole meaning of new concept. Besides, the new concept was an indicator of new management phenomena and it focused on managing intangible actives and developing the company success based on intellectual resources.

The discussion has revealed concerning approaches to definition of the intellectual capital and its interrelation with concept of intangible actives. (Itami 1991, Hall 1992, Smith 1994, Brooking 1997, Edvisson 1997, Bontis 1998, Boudreau and Ramstad 1997, Davenport and Prusak 1997, Stewart 1997, Sullivan 2000, Lev 2001, Rastogi 2003, Andreou et al 2007). There are also important papers concerning systemizing different approaches. (Kwee Keong Choong 2008, УДОВИЧЕНКО О.М. 2007, Просвирина И.И. 2004)

Analyzing the definition of intellectual capital it is very important to mention the paper of D.L. Volkov and T.A. Garanina (Волков, Гаранина 2007). Researchers precisely analyze approaches to the intellectual capital and offer following definition. It as “any asset belonged to the organisation or supervised by it, without material or financial (in case of financial investments) forms, but capable to bring economic gains to the organisation in future, represents itself as an intangible asset. The set of intangible assets of the organisation can be called also the intellectual capital or intangibles. At the same time it is necessary to separate two subgroups of intangibles: recognised intangible assets and non-recognised intangible assets in case of accounting and reporting intangible assets.” (Волков, Гаранина 2007: 85)

Thus we agreed with approach of common meaning of intellectual capital and intangible assets. This approach allows taking advantage of knowledge and assessment instruments which are developed by foreign researchers.

It is necessary to notice even for one approach to identifying intellectual capital, there is no common opinion concerning its structural elements. (Brooking 1997, Edvinsson and Malone 1997, Bontis 1998, Roos et all 1997, Sveiby 1997, Stewart 1998, Andriessen and Tiessen 2000). Nowadays some papers systemize different researchers` opinions. (Kaufmann, Schneider 2004; Huang C.C., Luther R., Tayles M. 2007; Leliaert Ph. 2003; Choong K.K. 2008) The majority of foreign and Russian authors mark out three independent categories of the intellectual capital:

human capital, organisational or structural capital and client or relational capital. Some researchers, in particular Sveiby (Sveiby K.E. 1997), highlight the importance of interaction between the elements.

The structure of the intellectual capital is also analyzed by Volkov and Garanina. They develop definition and features of three elements. Their approach is based on classification of intangible assets given by International Federation of Accountants (IFAC, 1998). At the same time according to the purposes of this research it is important to focus on measurement of these features to outline some indication of knowledge-intensive firm. As a basis for developing indicators we analyzed the definition of structural elements of intellectual capital given by Volkov and Garanina. (Волков, Гаранина 2007: 87) and examples of manifestation given by B. Marr (Marr 2004) (tab. 1).

**Table 1 Intellectual capital structure and measured indicators**

<b>Intellectual capital</b>		
Definition of the element	Example of manifestation	Measured indicators
<b><i>Human capital</i></b>		
Organisational ability to take economical benefits from employees' knowledge, skills and experience belonged them immanently.	Knowledge and skills Work-related experience Competencies Vocational qualifications Employee engagement Emotional intelligence Entrepreneurial spirit Flexibility Employee loyalty Employee satisfaction Education Creativity	Innovative production share in Total production volume, Availability and quantity of Quality awards for quality and Client claims, Productivity of labour, Share of expenses for training in the general fund of expenses for the personnel, Share of employees with higher education, Staff turnover
<b><i>Relational capital</i></b>		
Organisational ability to take economical benefits from resources of firm external relationships.	Formal relationships Informal relationships Social networks Partnerships Alliances Brand image Trust Corporate reputation Customer loyalty Customer engagement Licensing agreements Distribution agreements Joint ventures	Brand capitalization, Duration of relationships with Suppliers and customers, Quantity of canceled contracts, Beats from poor contract performance, Share of additional services in total amount, Increase of contacts with suppliers and clients, Share of stable customer, Availability and quantity of business cooperation, Amount of license income from franchising
<b><i>Structural capital</i></b>		
Organisational ability to take economical benefits from knowledge inside the firm.	<i>Organisational culture</i> Corporate values Management philosophy	Staff turnover
	<i>Intellectual property:</i> Patents, copyrights, Trade secrets, Trade marks, Brand names, service marks, origin places of goods production, copyrights, other exclusive rights	The quantity of repeated license, quantity of intellectual property objects
	<i>Processes and routines:</i> Formal processes Tacit or informal routines management procedures, information systems, decision making process etc.	Share of accepted decisions in time, Existence of written management procedures (regulations, norms), Existence and payback period for information system.

In general defining knowledge-intensive firm through intellectual capital assumes an measurement of the contribution of the intellectual capital in the firm general results. Particularly, we may consider a company as knowledge-intensive firm if the effect of intellectual capital (intangibles) on general revenue performance is positive. (Волков, Гаранина 2007: 91-92) In this case adequate measurement of intellectual capital is very difficult to provide.

Literature analysis shows different approaches to intellectual capital measurement. (Tab. 2) Growing interest in this field of study is illustrated by papers focused on systematization of measurement methods. (Vaskeliene L., Choong C.C. 2008, Jin Chen and ect., 2004).

**Table 2 Methods for Intellectual capital measurement**

<b>Method description</b>	<b>Method peculiarities: strong and weak sides</b>	
	<b>Advantages</b>	<b>Source for development</b>
<b><i>Methods based on BSC</i></b>		
<b>The invisible balance-sheet (IBS)</b> Developed by Konrad Group, which includes Karl-Erik Sveiby. It is a broader variant of BSC, which includes four perspectives: financial, client, business processes, innovation and development.	BSC is widespread and worked out.	Static estimation, individual approach for each company makes it difficult to compare firm results.
<b>Skandia AFS business navigator (SBN)</b> Skandia AFS developed on the basis of BSC by L. Edvinsson. Skandia measures performance with 30 KPI in four perspectives: finance, clients, human resources, development and trust.	Results of measurement are used for operational management.	Provides results of past activities. Does not provide a source for comparing.
<b><i>Financial methods</i></b>		
<b>Economic value added (EVA)</b> Developed as a complex measurement of results by Stern Stewart and Co, an American consultant company. Includes several perspectives: financial planning, including budgeting, decision making process, performance measurement, relations with shareholder, reward system.	Relation with company value measurement and equity value estimation.	Difficult for future prognoses. Lack of non financial indicators.
<b>The return of assets (ROA)</b> Average level of income before taxes for	Available to measure for almost all	Lack of not financial indicators, difficult to

last 3-5 years divide average level of tangible assets for the same period. The result is compared with economic sector index. Difference is analyzed. If this difference is positive then company has its intellectual capital.	companies, the comparison is possible.	use for effective managing intellectual capital.
<b>Market capitalization method (MCM)</b> Market measurement of intellectual capital. Market capitalization is estimated and if there is some surplus, then this surplus is considered as intellectual capital. Inflation and substitute expenses are considered as important.	Available to measure for almost all companies, the comparison is possible.	Lack of not financial indicators, difficult to use for effective managing intellectual capital. Looks similar with Steward method.
<b>Calculated Intangible Value (CIV)</b> Developed by Stewart. The example of estimation introduced by Volkov and Garanina (Волков, Гаранина 2007). Intellectual capital is the difference between book value of all assets and discount flow residual operational return and tangible assets value defined by book value and discounted flow residual profit by average branch income. This difference characterizes ability of the firm to take advantage from intangible assets.	Precisely described and tested.	Difficult to find financial indicators of intellectual capital. Lack of not financial ones, focused on estimation intellectual capital in present. Lack of dynamic approach.
<b><i>Indexes: combining financial and non financial indicators</i></b>		
<b>The direct intellectual capital method (DICM)</b> Direct measure of intellectual capital elements. For example client orientation, patents, know-how, information systems, employee education etc. Then total intellectual capital is calculated.	Very complex and detailed method.	Static approach. Lack of financial component.
<b>IC-index</b> Is a second generation practice which analyzes the whole process of value creation. (Roos 1997) Suggests estimation	Complex approach integrates individual indicators is oriented on dynamic	It is difficult to create system of indicators. Also there is a lack of financial estimations

of doubled index based on different indicators of intellectual capital. (Roos 1998)	measurement. It is possible to measure corporate or branch index. (Roos 1998)	and relation with company value.
<b>Technology broker (TB)</b> Introduced by A. Brooking (Brooking 1998) Audit of intellectual capital value and measurement in money equivalent. Brooking suggest three ways of TB: - cost approach: measurement of investments in assets, - market approach: comparing with average to assess the assets, - income approach: measurement of income from intangibles (capitalization).	Includes financial and not financial indicators, suggests three different approaches.	It is a challenge to transform some not financial indicators into money equivalent. The literature does not show precise list of not financial indicators.
<b>Financial method of intangible assets measuring (FiMIAM)</b> Based on Leliaert's three field model and independence of three intellectual capital elements. Measures value of three structural elements. Is positioned as management technology, allows comparing results of the company in different periods.	Very complex index. Allows comparing intellectual capital and its structural element of different companies.	Few information about indicators for measurement of each field.

Apparently some methods are based on financial measurement, other – on economic measurement which combines both financial and not financial indicators. And in combining both sides economic measurement provides idea of the system analysis of intellectual capital. We agree with the economic approach because experience illustrates that not all components of intellectual capital can be measured by financial indicators. For instance personal stability, structural balance, trust of clients are very hard to measure in direct financial value, though, undoubtedly, these components influence on companies' performance.

Besides, it is necessary to note limits of financial criteria. They are more often connected with measurement of current situation which reflects results of last activity. In this sense these criteria are not capable to estimate possible influence of intellectual resources on performance in future fully. It complicates the decision about investments in intellectual capital and its structural

elements. We agree with J. Fitz-enz who tells that it is necessary to get rid of a myth that “only standard financial information is precise”. In practice financial indicators reflect the situation partly. It is caused by systems of the financial reporting which are created by people, and, hence, bear on their perception and understanding of occurring processes (Фитц-енц 2006: 26).

The system approach to intellectual capital measurement assumes a combination of both financial and non financial indicators forming on this basis an integrated index. In this context methods described as indexes represent doubtless interest. In general three logic schemes concerning intellectual capital measurement could be described. The first is based on the financial estimation described by T. Stewart (Стюарт 2007). The second one is economical logic which is presented in particular in works of Roos and Brooking). It provides a measurement of investments into the intellectual capital, measurement of return of investments and a comparative market estimation (competitive differences, for example, labour productivity above average)

The most developed methods are financial ones. There are studies devoted to a financial measurement of structural elements of intellectual capital. However we consider that the financial estimation does not reflect a condition and quality of management intellectual capital. That is because many indicators of intangible assets are not reflected or are reflected nominally in book value in Russia. This result to economical logic suitability and measurement each company by integrated index based on indicators from Table 1. Such index allows measuring not only the intellectual capital as a whole, but also its structural components separately. In this case concerning the aim of the paper we may describe the criteria of knowledge-intensive firm as the contribution of one of the structural elements of the intellectual capital to the organisational performance.

### **3. Human capital in Knowledge-intensive firm**

For knowledge-intensive firms Human capital has the main value. Why is it so? As T. Stewart suggest “a company based on knowledge travel light. After information had replaced a lot of material objects, taken off tangible cover, begun to live own business life, the company became absolutely other organism... Key funds of such company not only intangible, but also it is not clear, who owns them and takes responsibility for them” (Стюарт 2007: 66)

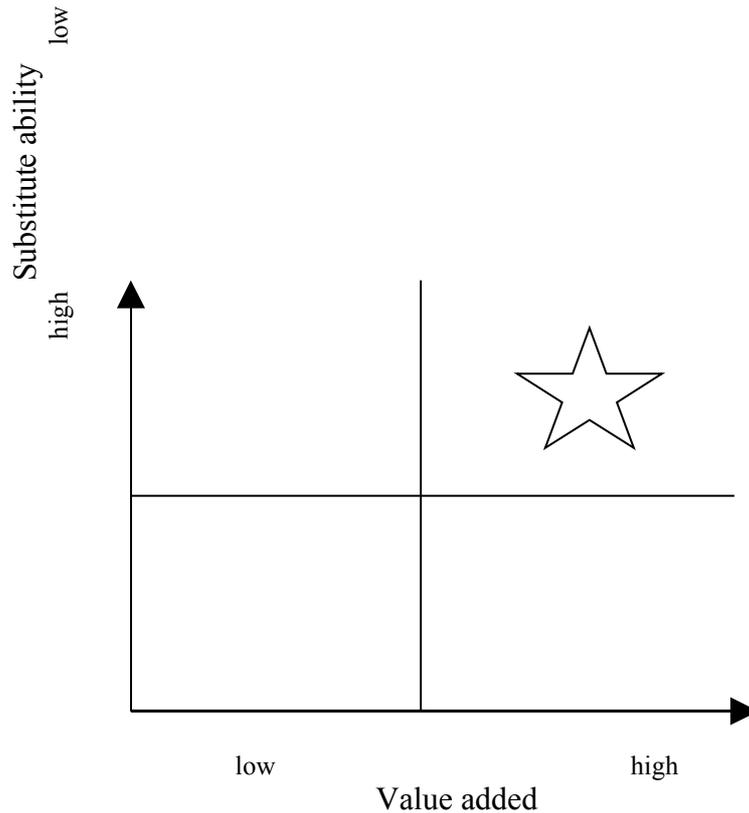
The knowledge which value promptly grows in modern economy, is created by people that is why, its content, quality and whether it belong to the organisation or not depends on people. Managers, whose duty is to protect and accumulate company assets have to search ways how intellectual assets which brings revenue and competitive advantage could be created by employees. Knowledge, skills and abilities of workers define unique competitive advantages of

the modern companies. And only people create the organizational capital and provide relations with clients, consumers, suppliers etc.

Human capital is defined as knowledge, skills and abilities of employees which can be converted into incomes of their owners. (Blackler 1995; Scarbrough 1999; Davenport 2000; Андреева, Юртайкин, Солтицкая 2006). The question is who and in what extend is the owner of human capital, i.e. receives the income from knowledge, abilities, skills etc. The answer is depends on investors and the structure of investments in human capital.

According to G. Becker's concept, the company invests not in general knowledge and competences, but in specific ones, which have value for the company. In this case it is possible to say that companies become the owners of the specific human capital. The companies receive the income from special knowledge, skills and abilities, and also from how HRM is organised. The focus on the specific human capital brings the problem of the differentiated approach to employees in the company. One of the decisions offered in literature, is concept of "internal labour market" (Edvardsson 1992; Gronroos 1990; Mitchell 2002; Калабина 2009: 324-325). Internal labour market describes a model of interaction between the employer and the employee from a position of values exchange. The more significant for the company employee knowledge, skills and abilities are, the above there value possesses. In this case there is a need to divide employees on core and peripheral.

Core employees (CE) can be defined as those who bring fundamental or principal value of intellectual capital and provide the source for competitive advantage. Thus Stewart describes four categories of employees.



Following Stewart's logic, CE are those who are hard to replace and who provide high added value to the firm. Thus, it is possible to say that CE form core knowledge, competences and abilities of the company.

There is a big attention in literature devoted to managing knowledge of CE, and much less attention - to their abilities. In this case it is necessary to analyse the features of such employees. On this base the CE profile should be developed. We suppose that the conducted research allows revealing the generalised CE profile of knowledge-intensive firm. And based on this profile HR technologies could be developed.

## 4. HRM model based on Core Employees

### 4.1 Theoretical analysis of core employee concept

Basing on literature analysis two main approaches to CE identification are revealed. The first one, let's call it static approach, is oriented on assessment results of employees which hold specific posts. The employee is considered as a CE if his results are higher than average. Apparently, the criterion for CE identification is labour productivity level in this case. Certainly it is an important criterion, but it poorly reflects the employee contribution to the company development. Besides, the given approach considers the post status: the higher status is, the more valuable employee is. Not casually that the supporters of this approach consider top-managers as the core and most valuable employees in the company (Powell, 2002). Certainly, top

management plays extremely important role in business development, however, obviously, that not every top management representative can be a CE. Enough examples are known when top-managers activity led to crash of the companies. Therefore the direct correlation of the post status with a role of a CE will be hardly defensible.

The second approach, dynamic one, is focused measurement of employee potential and his/her contribution to company development. We consider this approach as long-term and more perspective. According to the given approach those employees who possess specific competence, necessary for core business development are CE. These people influence mutual relations with clients, their loss or their mistakes may strongly influence in company results (Teitelbaum 2004:52). Lepak and Snell (Lepak and Snell 1999, 2002), base on resource theory and human capital theory, indicates two criteria for employee analysis: value and uniqueness. In their opinion, those employees who possess both valuable unique knowledge and skills, become core for the company.

In our opinion, there is a very important approach to CE identification, developed by the Spanish scientists Alvaro Lopez-Cabrales, Ramon Valle and Innes Herrero (Lopez-Cabrales, Valle & Herrero 2006). According to authors, a CE is the one who possesses valuable and unique knowledge, skills and abilities so he/she has the unique human capital. Besides, the activity of CE is connected with the core business of the company (Atchison 1991). CE do not only possess valuable and unique abilities, but they transform them into organizational abilities. The Spanish researchers allocate three groups of competences which can be considered as criteria for mark out a CE. It is organisational, technical and client orientation competences. However authors do not give a lot of attention to social skills (N. Fligstein 2001) and learning abilities.

Our study is a part of on-going Russian-Finnish STROI Network research project. It is conducted by HAMK University of Applied Sciences, Tampere University of Technology, VTT Technical Research Centre of Finland, Higher School of Economic from Moscow and State University, Graduate School of Management and Faculty of Sociology from St Petersburg.

The main idea of the whole project is to find out management and leadership models suitable for Russian business context. The main research field for this project is a constructive market both in Finland and Russia. Finish construction oriented firms, operated in Russian market are studied. In our opinion, constructive market is a vivid example of project-based business.

#### **4.2 Description of pilot survey**

The pilot survey was a part of Russian-Finish STROI Network research project conducted in 2008-2009. It was conducted by HAMK University of Applied Sciences, Tampere University of Technology, VTT Technical Research Centre of Finland, Higher School of Economic from Moscow and State University, Graduate School of Management and Faculty of Sociology from St Petersburg.

The main idea of the whole project is to find out management and leadership models suitable for Russian business context. The main research field for this project is a constructive market both in Finland and Russia. Finish construction oriented firms, operated in Russian market were studied. Companies connected with construction industry include consultant firms, construction companies, design firm, training firms and etc. For the HR part of the project 12 companies have been investigated. The size of private firms ranged from small (under 20 employees) to large (over 3,000). Some of the companies have operated on the market for more than 30 years, others are just new comers. Qualitative data have been collected by conducting 19 semi-structured interviews with the senior managers, heads of the departments and HR managers. There were face-to-face interviews 1 hour duration.

The current study is an example of how qualitative, open-ended interviewing can lead to new conceptual insights and issues (for a study based on similarly ‘unlooked for’ results, see Buckley and Chapman, 1997). Interviews were designed through six blocks including two blocks of questions about defining and managing CE. In some cases we had contacted the informant before the interview, thus he/she had a possibility to look through the main topic for discussion and to have more time for deeper talk during face-to-face meeting. Others interview have been made without preliminary familiarization with the questions.

### **4.3 Extract results**

We were interesting what kind of competences will be highlighted for core employees. The most interesting definitions for CE given by informants were:

*“Key persons support key clients in our company. They constantly monitor client’s situation...That help us to predict activity of competitors who can make interesting suggest to our client”.*

*“They can agree upon difficult situation, do not afraid of responsibility and decision-making, can use support then necessary”.*

*“Core employees “transmit the feeling of company”. They should be very responsible, because they are company representative and can form an image of the whole firm”.*

*“They play on the field and should be very active”.*

*“Core employees are department managers. They have work experience usually more than 10 years, good interactive skills and an ability to get along with their teams”.*

*“Core employees whom you can really trust are well-known for managers, sometimes called as worker with “hands”. These are really capable workers”*

*“Key persons are the ones having strategic knowledge and multiple skills. These persons carry out their work on excellent level”*

*“CE... make money for the company”*

*“CE have very high level of social or communicative skills, they create partnerships and networks.”*

We have seen that the most important features for CE are not only social and communicative skills, self-determination but also high level of mobility. It means that the employees need to be ready to move not only vertically but also horizontally (different subsidiary in other region). CE also is not afraid of taking more responsibilities.

Based on interviews we could say that a lot of companies highlight their CE, but they have very different criteria for their identification. In one company CE are described as high-potential employees. In another case they are characterized as high-performer. In the companies which implement Hay's system CE are recognized as those who have the highest grades. For some companies CE are described by special features.

The practice of financial evaluation of CE impact (contribution) is not developed. But there is a common practice to evaluate satisfaction, expectations, challenges and etc.

Based on analysis of informant's opinion concerning risks and problems associated with CE we can state 3 main aspects:

On the stage of CE identifying there are some mistakes which can lead to investing into “wrong people”.

Some people regarding as CE tend towards ‘star fever’. Therefore they can expect exaggerated attention from the management to them and their demands can be steep and unreasonable.

CEs are very influential and important persons in the company, they concentrate essential functions, connections, take part in strategic decision making, etc. Therefore if somebody of them decides to leave the company it can face with risk of losing money or clients, or braking significant activities.

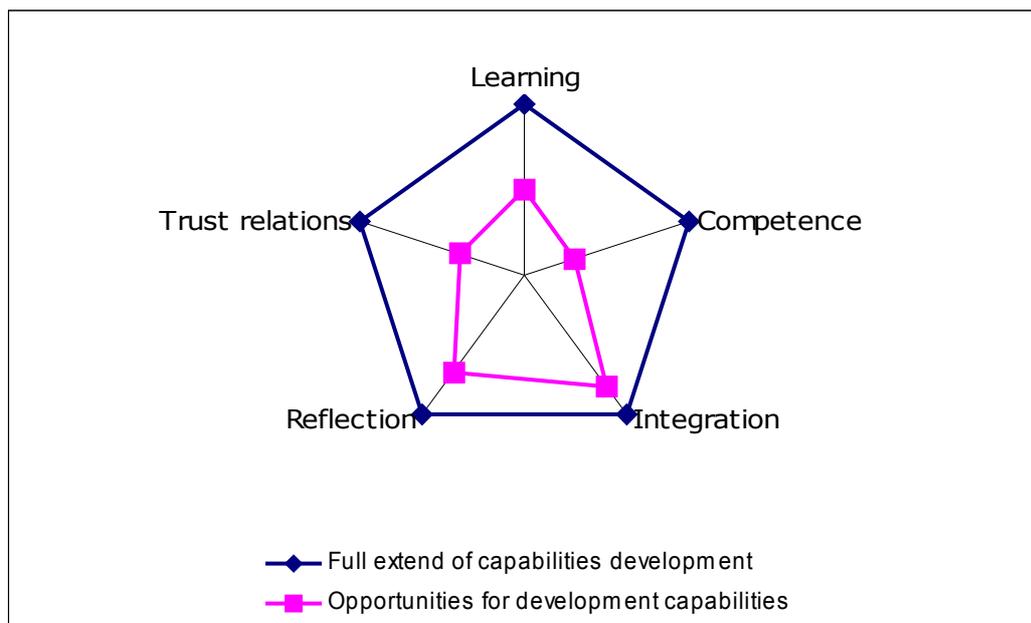
The pilot survey allowed formulating a hypothesis about criteria of CE identification. Each of the criteria is defined as group of the competences which provide sustainable competitive advantages of the company. (Figure 1):

- Learning: the ability to learn by experience and from best practice

- Competence: the ability to develop technique aspects of products and services
- Integration: the ability to integrate all stakeholders. It could be the team or the whole network. Social or communicative skills are very important here. And a CE becomes a social knot of he or she develops this group of capabilities.
- Reflection: it is very important to realize and reflect all the experience developed in organization. Rethinking and taking decisions based on the analysis. This capability provides the dynamic for the company. This is a sigh of learning organization.
- Trust relations: the ability to build trust in relations with stakeholders. Trust is a very important feature of social capital of organisation.

System approach allows describing these groups of capabilities on each level of a firm: employee level, team level and organizational level. And the extent of possessing these abilities describes the uniqueness of the employee, team or organization.

**Figure 1. Five groups of CE capabilities**



We consider that social component is one of the most crucial in the list of these groups of capabilities. It is very important for knowledge-based firms to develop interfirm and intrafirm trust and cooperation. CE is able to have relations with people from very different social and professional environment. As CE could be considered as a knot in a social network not only value and uniqueness of KSA are needed to be measured, but also sociometric tools are required for CE identifying.

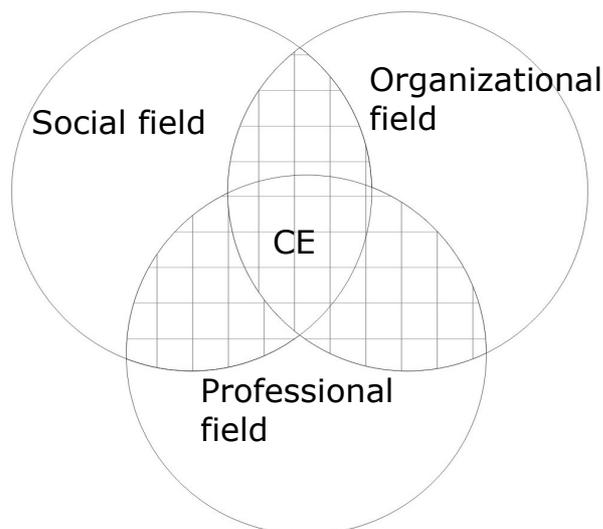
It is clear that the listed abilities cannot be equally developed, in any case there are dominant abilities, for example, people with critical style of thinking hardly will be good integrators or trust conductors. Therefore the balance, a certain sort a combination of the

specified abilities is important. It is necessary to notice that the configuration of abilities (their parity) depends on branch, a stage of life cycle of the organisation, strategy of the company and of some other factors.

One of the key aspects of CE identification is the social aspect. For social component of the intellectual capital inter- and intraorganizational trust is very important. CE co-operate with people from various social and professional groups. As the CE is considered as social knot not only degree of value and uniqueness of his/her knowledge of skills and abilities should be measured but also mutual relations.

We suggest that three-field model is applicable for CE recognition (Figure 2). There could be three main fields or levels which influence on growing CE of the company: social field (all the colleagues and informal groups at workplace), organizational field (usually management of the company who notice most valuable employees and give them more responsibility and credentials) and professional field (all kind of different internal specialists and external societies and organizations which consider this person as an expert).

**Figure 2. Three-field model for CE identification**



The analysis above allows us to draw a conclusion that CE identification is connected with forming the profile of competences which defined by five groups of abilities. However this conclusion generates a new problem: who and as should develop a CE profile.

We consider that for forming CE profile experts from three groups need to be involved. The experts are representatives from management of organisation, professional associations and social network which is important for the company. It could be intrafirm or iterfirm network. Experts opinions could become the base for CE profile development.

Thus, for knowledge-intensive firm the HRM model, based on dividing employees on core and peripheral is adequate. Both groups of employees are important for the organisation, however, CE are capable to create not copied competitive advantages of the company.

One of the major problems of management human resources in knowledge-intensive firm become developing and changing if necessary CE profile. The CE profile consist of concrete characteristics which fulfill each of the group of abilities marked above. Froming CE profile will promote increasing of efficiency of recruitment, assessment and development technologies and also construction of more productive reward systems.

First of all managing CE supposes to create such conditions that are favorable for realisation and further development of their abilities, for increasing their contribution organisational performance.

## **Conclusion**

Growing number of companies, which consider intangible assets as the basic source of the income, requires studying these companies, developing management models and identifying requirements to management in these companies.

More and more often new publications devoted to the organisations, based on knowledge, or knowledge-intensive firms, appear. However there has not been any accurate definition of identification criteria yet.

We agree with those researchers who define knowledge-intensive firm trough intellectual capital concept which focuses on necessities of investments into intangibles and also on acquisition of income (profit, rents) from these assets. And though definition of intellectual capital is treated ambiguously, at the same time, it reflects the essence of the organisations of a new type. They unlike the organisations of an industrial era base their activity not so much on tangible assets, but on information resources and knowledge. And skills and abilities of the people working in these organisations become a key source of development.

Identification of knowledge-intensive firm assumes measurement of intellectual capital influence on economic and financial results of their activity. This measurement is related to certain difficulties, and not only because of complexity of intangible aspects measurement. First of all, it is necessary to note heterogeneity of the intellectual capital, the unequal contribution of its structural elements to the results of company activity. Besides, it is important to mention methodical difficulties which are caused, in particular, by backwardness of information base for calculation of an integrated indicator of the intellectual capital, and also indicators of its structural elements: the human capital, relational (client) capital, the structural (organizational) capital.

Key criteria for identification could be considered positive influence of the intellectual capital on economic and financial results of its activity. positive influence of separate structural elements of the intellectual capital on end results of its activity may also be devoted to criteria of knowledge-intensive firm.

From the HRM point of view knowledge-intensive firm represents the greatest interest the through a prism of the human capital. In this case we speak not about general human capital, but about the specific human capital, which is “connected with intolerable assets return from which can be received only on certain workplaces or in the concrete firm conditions” (Калабина 2009: 324).

Focus on the specific human capital challenge the traditional approach to HRM. There is a requirement for developing HR models, based on concept of “internal labour market”. One of the major features of internal labour market is its segmentation on primary and secondary sectors, i.e. dividing personnel into a personnel kernel and a personnel periphery, differed by working and employment conditions. (Калабина 2009: 326). Personnel kernel is formed by core employees. It is extremely important to develop human capital profile for CE in exact company.

The pilot survey conducted by authors allowed reviewing five clusters of competences which are necessary for CE in knowledge-intensive firm. These clusters include professional (technical) competences, learning, reflection, integration ability and ability to create and sustain trust in organisation.

The tasks of future research include:

- Detailing content of each cluster
- Defining human capital profile of CE for different groups of personnel on model level
- Testing models of human capital profile for CE in exact organization

## Literature

- Волков Д. Л., Гаранина Т. А. Нематериальные активы: проблемы состава и оценивания / Д. Л. Волков, Т. А. Гаранина // Вестник Санкт-Петербургского Университета. Серия 8. Менеджмент. – 2007. Вып. 1– С. 82-106
- Калабина Е.Г. Управление взаимодействием региональных и внутренних рынков труда: теоретический анализ и эмпирические оценки (на примере компаний уральского региона) // Современный менеджмент: проблемы, гипотезы, исследования: сб. науч. тр. [Текст] / Гос. ун-т – Высшая школа экономики, ф-т; научн. ред. М.Ю. Шерешева. – М.: Изд. дом гос. ун-та – Высшей школы экономики, 2009. С. 323-340.
- Просвирина И.И. Интеллектуальный капитал: новый взгляд на нематериальные активы [Электронный ресурс] / И. Просвирина // Финансовый менеджмент. – 2004. – № 4. – М. : Финпресс. , 2000 - . - Режим доступа : <http://www.finman.ru/articles/2004/4/2309.html>, свободный. – Загл. с экрана.
- Руус Й., Пайк С., Фернстрем Л. Интеллектуальный капитал: практика управления / Й. Руус, С. Пайк, Л. Фернстрем; пер. с англ. под ред. В. К. Дерманова. – Высшая школа менеджмента СПбГУ. СПб. : Изд-во «Высшая школа менеджмента»; Издат. дом. С.-Петербург. ун-та, 2007. – xii + 436 с.
- Стюарт Т.А. Интеллектуальный капитал. Новый источник богатства организаций /Пер. с англ. В. Ноздриной. – М.: Поколение, 2007.
- Удовиченко О.М. Понятие, классификация, измерение и оценка нематериальных активов (объектов) компании: подходы к проблеме – Научный доклад 13(R)-2007.
- Фитц-енц Я. Рентабельность инвестиций в персонал: измерение экономической ценности персонала /Як Фитц-енц; пер. с англ.: [Меньшикова М.С., Леонова Ю.П.]; под общ. Ред. В.И. Ярных. – М.: Вершина, 2006.
- Alvesson M. Organizations as Rhetoric: Knowledge - Intensive Firms and the Struggle With Ambiguity, *Journal of Management Studies*, November 1993, pp. 997-1015.
- Andreou, A.N., Green, A. and Stankosky, M. (2007), “A framework of intangible valuation areas and antecedents”, *Journal of Intellectual Capital*, Vol. 8 No. 1, pp. 52-75.
- Andriessen, D. and Tiessen, R. (2000), *Weightless Weight – Find Your Real Value in a Future of Intangible Assets*, Pearson Education, London.
- Atchison, T. (1991), The employment relationship: Untied or re-tied. *Academy of Management Executive*, 5(4), 52–62.
- Barney, J. B. (1991), Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99–120.
- Bontis, N. (1998), “Intellectual capital: an exploratory study that develops measures and models”, *Management Decision*, Vol. 36 No. 2, pp. 63-76.
- Boudreau, J.W. and Ramstad, P.M. (1997), “Measuring intellectual capital: learning from financial history”, *Human Resource Management*, Vol. 36 No. 3, pp. 343-56.
- Brooking, A. (1997), *Intellectual Capital: Core Asset for the Third Millennium Enterprise*, Thomson Business Press, London.
- Davenport, T.H. and Prusak, L. (1997), *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, Boston, MA.
- Davis S and Botkin J, The Coming of Knowledge-Based Business, *Harvard Business Review*, September-October 1994, pp. 165-170.
- Dayyani B, (2009), Structured Analytics: The Creation of the Intelligent Company, *Proceedings of world academy of science, engineering and technology*, February 2009, vol. 8, pp. 973-988
- Drucker P.F., The Coming of the New Organization, *Harvard Business Review*, January-February 1988, pp. 45-53.
- Edvardsson B. Service breakdowns: a study of critical incidents in an airline // *International Journal of Service Industry Management*, 1992, Vol. 3 No. 4, pp. 17-29

- Edvinsson, L. (1997), "Developing intellectual capital at Skandia", *Long Range Planning*, Vol. 30 No. 3, pp. 320-31.
- Edvinsson, L. and Malone, M.S. (1997), *Intellectual Capital: Realizing your Company's True Value by Finding its Hidden Brainpower*, Harper Business, New York, NY.
- Ekstedt, E., Lundin, R.A., Söderholm, A., & Wirdenius, H. (1999), *Neo-Industrial Organizing: Renewal by Action and Knowledge Formation in a Project-Intensive Economy*. Routledge, London. Excellence, Vol. 8 No. 1, pp. 3-5.
- Gronroos C. *Service Management and Marketing*, Macmillan/Lexington Books, New York, NY, 1990.
- Hall, R. (1992), "The strategic analysis of intangible resources", *Strategic Management Journal*, Vol. 13 No. 2, pp. 135-44.
- Harrison, S. and Sullivan, P.H. (2000), "Profiting from intellectual capital – learning from leading companies", *Journal of Intellectual Capital*, Vol. 1 No. 1, pp. 33-46.
- Itami, H. (1991), *Mobilizing Invisible Assets*, Harvard University Press, Cambridge, MA.
- Kaplan, R.S. and Norton, D.P. (2000), *The Strategy Focused Organisation: How Balanced Scorecard Companies Thrive in the New Business Environment*, Harvard Business School Press, Boston, MA.
- Kaplan, R.S. and Norton, D.P. (2004), "Measuring the strategic readiness of intangible assets", *Harvard Business Review*, Vol. 82 No. 2, pp. 52-63.
- Kaufmann, L. and Schneider, Y. (2004), "Intangibles: a synthesis of current research", *Journal of Intellectual Capital*, Vol. 5 No. 3, pp. 366-88.
- Kwee Keong Choong (2008), Intellectual capital: definition, categorization and reporting models, *Journal of Intellectual Capital*, Vol. 9 No. 4, 2008, pp. 609-638
- Lado, A., & Wilson, M. (1994), Human resource systems and sustained competitive advantage: A competency based perspective. *Academy of Management Review*, 19, 699–727.
- Leliaert J. P., Candries W. and Tilmans R. Identifying and managing IC: a new classification, *Journal of Intellectual Capital*, Vol. 4 No. 2, 2003, pp. 202-214
- Lepak, D. P., & Snell, S. A. (2002), Examining the human resource architecture: The relationships among human capital, employment and human resource configuration. *Journal of Management*, 28, 517–543.
- Lepak, D. P., Takeuchi, R., & Snell, S. A. (2003), Employment flexibility and firm performance: Examining the interaction effects of employment mode, environmental dynamism and technological intensity. *Journal of Management*, 29, 681–703.
- Lev, B. (2001), *Intangibles: Management, Measurement, and Reporting*, The Brookings
- Liebowitz J. and Suen Y. Ch. Developing knowledge management metrics for measuring intellectual capital, *Journal of Intellectual Capital*, Vol. 1 No. 1, 2000, pp. 54-67
- Lopez-Cabrales, A., Valle, R., & Herrero, I. (2006), The contribution of core employees to organizational capabilities and efficiency. *Human Resource Management*, 45, 1, 81–109.
- Marr, B. (2004), "Measuring intangible assets: the state of the art", *Measuring Business*
- Marr, B., Gray, D. and Neely, A. (2003), "Why do firms measure their intellectual capital", *Journal of Intellectual Capital*, Vol. 4 No. 4, pp. 441-64.
- Mouritsen, J. and Bukh, Dealing with the knowledge economy: intellectual capital versus balanced scorecard, *Journal of Intellectual Capital*, Vol. 6 No. 1, 2005, pp. 8-27
- Mouritsen, J., Larsen, H.T. and Bukh, P.N.D. (2001), "Intellectual capital and the 'capable firm': narrating, visualising and numbering for managing knowledge", *Accounting, Organization and Society*, Vol. 26 Nos 6/7, pp. 735-62.
- Nazari A. J. and Herremans M. I. Extended VAIC model: measuring intellectual capital components, *Journal of Intellectual Capital*, Vol. 8 No. 4, 2007, pp. 595-609
- Nerdrum L. and Erikson T. Intellectual capital: a human capital perspective, *Journal of Intellectual Capital*, Vol. 2 No. 2, 2001, pp. 127-135
- Nurmi R, Knowledge-Intensive Firms, *Business Horizons*, May-June 1998, pp. 26-32.

- Petty R. and Guthrie J. Intellectual capital: literature review, *Journal of Intellectual Capital*, Vol. 1 No. 2, 2000, pp. 155-176
- Powell T. (2002), 'Key People' Are Secret Of Success At Powers Great American Midways. *Amusement Business*, 114, 42, 24-26.
- Rastogi, P.N. (2003), "The nature and role of IC – rethinking the process of value creation and sustained enterprise growth", *Journal of Intellectual Capital*, Vol. 4 No. 2, pp. 227-48.
- Rodov I. and Leliaert P. FiMIAM: financial method of intangible assets measurement, *Journal of Intellectual Capital*, Vol. 3 No. 3, 2002, pp. 323-336
- Roos, J., Roos, G., Edvinsson, L. and Dragonetti, N.C. (1997), *Intellectual Capital – Navigating in the New Business Landscape*, Macmillan Press, London.
- Starbuck W.H., Learning by Knowledge-Intensive Firms, *Journal of Management Studies*, № 6, 1992, pp. 713-740.
- Stewart, T.A. (1997), *Intellectual Capital*, Nicholas Brealey Publishing, London.
- Sullivan P.H. and Sullivan P.H. Valuing intangibles companies, *Journal of Intellectual Capital*, Vol. 1 No. 4, 2000, pp. 328-340
- Sullivan, P.H. (1998), *Profiting from Intellectual Capital, Extracting Value from Innovation*, John Wiley, New York, NY.
- Sveiby, K.E. (1997), *The New Organizational Wealth: Managing and Measuring Knowledge-based Assets*, Barrett-Kohler, San Francisco, CA.
- Teece, D., Pisano, G., & Shuen, A. (1997), Dynamic capabilities and strategic management. *Strategic Management Journal*, 18, 509–533.
- Teece, D.J. (1998), Capturing value from knowledge assets: the new economy, markets for knowhow, and intangible assets. *California Management Review*, 40, 55-79.
- Teitelbaum, M.A. (2004), How to value a key person. *National Underwriter / Life & Health Financial Services*, 108, 34, 52-52.
- Zack M. D., Developing a Knowledge Strategy, *California Management Review*, 1999, pp. 125-145.
- Zack M. Rethinking the Knowledge-based Organization, *Mit Sloan Management Review*, pp.67-71