



VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETAS
VERSLO VADYBOS FAKULTETAS
VERSLO TECHNOLOGIJŲ KATEDRA

Dovilė Buinickaitė

INTELEKTINIO KAPITALO VALDymo MODELIS
INTELLECTUAL CAPITAL MANAGEMENT MODEL

Baigiamasis magistro darbas

Verslo vadybos studijų programa, valstybinis kodas 62403S121

Tarptautinio verslo specializacija

Vadybos ir administravimo mokslo kryptis

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Paaikškinti ir apibrėžti intelektinio kapitalo valdymo būtinybę ir problematiką. Išanalizuoti intelektinio kapitalo vertinimo metodus ir naudojamus modelius bei sukurti intelektinio kapitalo valdymo modelį. Atlikti tyrimą ir pritaikyti modelį įmonėse ir išanalizuoti rezultatus ir pateikti išvadas.

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Kalba

☐

lietuvių

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užsienio

Anotacija

Baigiamajame magistro darbe analizuojamas intelektinio kapitalo valdymas bei valdymo ypatumai, išskiriami apskaitos būdai ir nauda, bei procesai kuriuos įgyvendinant galima valdyti intelektinį kapitalą įmonėje. Pateikiami pagrindiniai intelektinio kapitalo elementai – žmogiškasis, struktūrinis ir ryšių kapitalai - kuriais remiantis atrenkami svarbiausi rodikliai nustatantys atskleidžiantys intelektinio kapitalo valdymo naudą. Pristatomas požiūris, jog finansinės ataskaitos praranda vertę, kadangi neskaičiuojami nematomi ištekliai.

Remiantis literatūros analize pristatomas intelektinio kapitalo valdymo modelis, kuris taikomas Pabaltijo mastu veikiančiai kompanijai. Tyrimas atliekamas remiantis intelektinio kapitalo užsienio praktikos analize, anketų ir ekspertinių interviu rezultatais. Apskaičiuojami bei analizuojami rodikliai, jų auganti reikšmė kompanijos finansiniams rezultatams ir kompanijos vadovybei. Didelis dėmesys skiriamas intelektinio kapitalo analizės vertei: tai naujas būdas pristatyti kompanija klientams ir darbuotojams, įgyti konkurencinį pranašumą, galimybė pritraukti investuotojų dėmesį bei vadovams įvertinti kompanijos ateitį. Išanalizavus teorinius ir praktinius intelektinio kapitalo valdymo aspektus, baigiamajame darbe pateikiamos išvados ir siūlymai.

Darbą sudaro 6 dalys: įvadas, intelektinio kapitalo valdymo analizė, intelektinio kapitalo modelio sudarymas, intelektinio kapitalo valdymo praktika ir modelio taikymas, išvados ir literatūros sąrašas.

Darbo apimtis – 83 p. teksto be priedų, 29 iliustracijos, 7 lentelės, 42 bibliografiniai šaltiniai.

Atskirai pridedami 4 darbo priedai.

Prasminiai žodžiai: intelektinis kapitalas, intelektinio kapitalo valdymas, intelektinio kapitalo matavimas, intelektinio kapitalo vertė

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Annotation

The final master thesis analyze the concept of intellectual capital management, its framework, IC measurement methods and their benefits are distinguished, also the main processes that implemented allows to manage intellectual capital in companies. The presentation of intellectual capital worth is based on the three main elements: human capital, customer capital and structural capital. The research also presents an approach of financial measures irrelevance over intellectual capital ones, because of their inability to account investments in intellectual capital, therefore the need to measure IC increases.

With reference to literature analyzed intellectual capital model is presented and tested in companies working across the Baltic's. Research is made relying on results of analysis of IC management foreign practice, questionnaires and experts interviews. The indicators are calculated, analyzed and recommendations for management of the companies given. A big attention is paid towards the ability of intellectual capital analysis to add value: a new way to present firm to customers and employees, gained competitive advantage, ability to attract investors attention and the basis for management decision on the company's future. After theoretical and practical analysis of intellectual capital management the conclusions and recommendations are presented.

The thesis consists of 6 parts: Introduction, analysis intellectual capital management, development of intellectual capital management model, intellectual capital management practice and model testing, conclusions and references.

The volume of thesis – 83p. without appendices, 29 figures, 7 tables, 42 sources.

Separate 4 appendices are added.

Keywords: intellectual capital, intellectual capital management, intellectual capital measurement, value of intellectual capital

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ABBREVIATIONS

IC – Intellectual Capital

ICM – Intellectual Capital Management

KM – Knowledge Management

R&D – Research and Development

IP – Intellectual Property

IT – Information Technology

PR – Public Relations

MV – Market Value

NA – Net Assets

CIV – Calculated Intangible Value

KPI – Key Performance Indicator

JIT – Just in time inventory

EPSI - European Performance Satisfaction Initiative

TQM – Total quality management

MCM - Market Capitalization methods

ROA - Return on Assets methods

DIC - Direct Intellectual Capital methods

SC - Scorecard Methods

SCR – Corporate Social Responsibility

Introduction

Today's economy is changing very fast making it difficult for companies to sustain competitive advantage and add value. Business that is oriented not only to its physical assets but also to its intangibles has more opportunities to be successful. The growth of information and knowledge led to increased interest in intellectual capital. As for many years it meant only brand today intellectual capital is understood more broadly: the possession of the knowledge, applied experience, and professional skills which when motivated in a right way, developed into customer or supplier relationships adds value to the development of organization (Canadian Council of Human Resources Associations). Companies are trying to adopt their activities to intangible economy and to develop systems to measure and manage intellectual capital because of the value it can bring. This interest was mainly influenced by two events in business environment: shift from production based economy to service and knowledge based one and the first thoughts about invisible balance sheet (doubt of financial reporting). According to Brennan and Connell, 2000, [3] substantial differences between company book values and market values indicate the presence of assets not recognized and measured in company balance-sheets. Intellectual capital assets account for a substantial proportion of this discrepancy. Measuring and reporting intellectual capital is not meant to be a substitute for traditional accounting measurement practices, but rather as a supplement that gives a better understanding and ability for potentials to make a right decision.

The main function of intellectual capital management in company's management process is the information needs satisfaction of both internal and external stakeholders that enables management decision-making competitive advantage development. However companies face two main problems when trying to manage their intellectual capital. First one, there is no common framework or tool for the management of intellectual capital and the measurements have the greatest utilitarian value when there is a possibility for comparison. The value will increase when IC will be managed over years and when information adds knowledgeable value about the situation. The second problem is the decreasing relevance of financial reports, because they are not capturing new sources of company's value. Therefore supplements such as intellectual capital reports became relevant. [2, 10]

A study of literature indicates that it is hard to define, classify and value intangible assets or intellectual capital especially when there no unified definition of intellectual capital or its management. World businesses started to recognize importance of intellectual capital and started to produce reports which are largely different from the traditional, financially-oriented ones. These reports (intellectual capital report, report on intangibles), have a common goal of emphasizing not only financial

dimensions, but also intellectual ones in order to identify value drivers which permit long-term, sustainable growth of the company. However none of these reports, statements and models has common structure.

Trying to describe, manage and calculate intellectual capital, I have developed intellectual capital management model. That concentrates on company's efforts to acquire, develop, share and maintain the intellectual capital to secure future results. The intellectual capital is the central element in the intellectual capital management model and consists of human, structural and relational capitals. It is a big step towards a greater value creation and development of intellectual capital.

The subject of this research paper is the analysis of intellectual capital based on the knowledge narrative, management challenges and intellectual capital indicators, and the application of this analysis to creation of intellectual capital management model.

The purpose of this research is with reference to literature analysis of intellectual capital management propose a model for intellectual capital management that is increasingly related to a value-creation process of an organization (not only knowledge – intensive organizations but also every business attempting to be successful in fast changing environment).

The objectives to meet the purpose of research:

1. To identify the meaning of intellectual capital management and the growing importance of intellectual capital over the financial measures
2. To present the structure of intellectual capital, identify measurement methods of intellectual capital used in individual companies and make comparative analysis of IC measurement models.
3. To make research analysis, for assessment and development of intellectual capital data in the companies
4. To analyze the calculated results and make the conclusions based on results of the model tested in retail industry companies.

The methods presented in the research thesis:

1. Overview, analysis and sum up of different resources on intellectual capital subject
2. Combination and integration of different information observed
3. Analysis of intellectual capital practice
4. Intellectual capital indicators calculation and analysis – questionnaires and abyssal interview used.

The whole research encompasses three parts. The theoretical part presents and explains the intellectual capital definition and management, and application of intellectual capital management in measuring, accounting and valuing. While the third part reveal the practical application of theoretical matters.

The first part identifies intellectual capital and presents a brief history of its growing importance in business environment. The irrelevance of financial measure over the intellectual ones is described and intellectual capital management framework (based on three elements) depicted. Reasons to manage intellectual capital are stressed out and models of IC measurement methods presented and compared. The object of this part is a clear understanding of the intellectual capital and the way it is managed.

The second part starts with the development of intellectual capital model. Structure of it is explained step by step and broader view is presented. Main measures used in intellectual capital application are described there too and the three pillars of IC – human, structural and relational capitals – are explained with the indicators falling under each pillar.

The practical part of the research paper starts with a great foreign practice of intellectual capital management and continues with the research made. There were many difficulties trying to convince companies to participate in intellectual capital research and ignorance of big Lithuanian companies to involve in this research was met. The intellectual capital analysis was made in retail chain companied that operates in three Baltic countries and is based on the model proposed. In the final subsection of this work generalizations are made foreign practice compared with the model being tested and results summarized. The conclusions follow after based on the analyses made in both parts of the research.

The relevance of this research paper lays in an idea that so little is done to manage and report intellectual capital of the organizations in Lithuania. The intellectual capital model tested in retail companies is the first step of going forward. The attention is brought to the value which is gained by intellectual capital analysis in the company (the fact that a company can have a greater financial result investing in its intellectual capital, new basis for deciding about company's future, presentation to customers and employees, sustainable competitive advantage).

1. Analysis of Intellectual Capital Management

1.1. Brief History of Intellectual Capital

For many years, intellectual capital and goodwill meant the same thing. Today, intellectual capital management is far broader. Although the issue of intellectual capital factors is still new, the intangibles in the organizations is not a phenomenon. However, certain elements can be identified that have influenced the rise of this issue – namely enormous development of information, licensing and communication technology. Huge investments in human capital and information technology are the key tools of value creation that often do not show up on company balance sheets. However, “intangible economy” is the new environment that companies have to learn to cope with.

Intellectual Capital became popular in the early and mid 1990s. It is an instructive aside to point out that knowledge management has exploded so rapidly that we can already speak of its predecessor of only a few years ago in the past tense. Intellectual Capital represents the awareness that information is a factor of production, in a category with land, labor, capital and energy - this was one of the first attempts to define intellectual capital. In the early and mid 1990s there was an increasing awareness in the business community that knowledge was an important organizational resource that needed to be nurtured, sustained, and if possible accounted for, even though knowledge management as such was defined a bit later. Peter Drucker, one of the firsts started to analyze knowledge as an input to productivity, that helps to reach wealth and as a source that applied to the assignments differently leads to innovation. Therefore human knowledge is the one that allows achieving wealth and novelties.

One more important step was internet's explosion during the 1990s that occurred concurrently with the intellectual capital movement. The business world realized that internet technology and procedures could be used to link an organization together. Using the internet and its conventions for data display and access, and limiting access to the members of an organization, results in an „Intranet“. This was easy to set up and administer, and the tools for employees to put information on the net and to access it were far superior. Intellectual capital was first defined as having two major components, information and knowledge capital (human capital), and structural capital. [9, 15, 23]

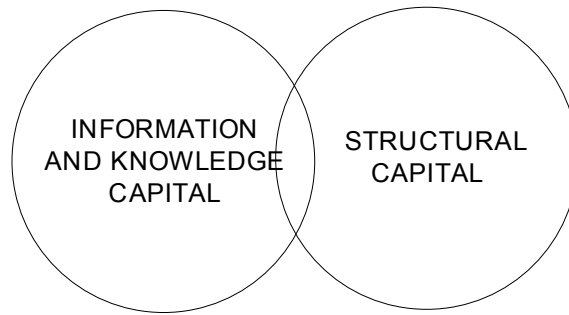


Figure 1. Two major components of intellectual capital [15]

Information and knowledge capital (human capitals) was of course the organization's information and knowledge, but the informal and unstructured as well as the formal. The structural capital was of course the mechanisms in place to take advantage of the information and knowledge capital, the mechanisms to capture, store, retrieve, and communicate that information and knowledge.

One immediate consequence of the appearance of intranets was the awareness that they could be used to facilitate communications with one's customers, as well as within the organization itself. Of course, electronic communications with suppliers and customers had been increasing since the 1970s, EDI, electronic data interchange and JIT, just in time inventory, being examples, but the intranet very much accelerated that process. One consequence of this was an expanded definition of intellectual capital to include the customer's and supplier's knowledge and input, relational capital.

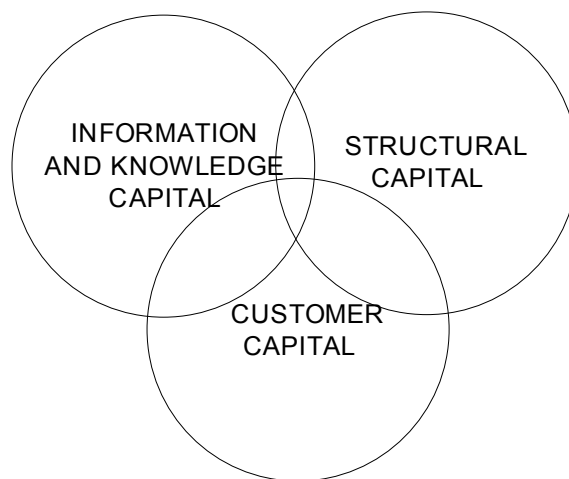


Figure 2. Components of intellectual capital [15]

The inclusion of relational capital was also unrelated to the popularity of TQM, Total Quality Management, in which responding to customer and supplier need and demand was a key element.

The expanded definition of intellectual capital, the increased interest in it led to the topic of „Balanced Score card“. The main idea here was that traditional financial reporting was too narrow in its outlook, and that in particular it focused only in the present and in the past, with no thought to the future. It was argued that there should be instead a „balanced score card“ that included the traditional financial measures, but that also measured other things such as comparative product quality, and customers or suppliers satisfaction and turnover, things that were more indicative of current performance and better indicators of likely future performance. By traditional financial indicators, if the current balance sheet looks good, but customers have begun to defect to the competition, there is nothing to reveal that the situation is in fact not healthy. [9] The idea was to resolve that anomaly. Intellectual capital is of course one of the obvious items that could help to solve the anomaly. One should be aware that the enthusiasm for the balanced score card arose partly as a consequence of the perception in the Anglo countries that their financial systems and the market's interest in short-term financial gain forced corporations in those countries to focus too much on the short term, with not enough thought for the long term, in contrast to the banking and financial reporting procedures in Japan and Germany and the East Asian tigers where corporations and their banks customarily enjoyed long term relationships which presumably fostered long-term thinking and strategy. The recent downturn in Japan and South East Asia, attributed in large part on too cozy relationships between companies and banks has made that thesis rather less compelling however. Information however is an extraordinarily diffuse and nebulous thing to attempt to quantify, and measuring and accounting for it (in the sense of the accounting profession) continues to be a daunting task. Only very modest progress has been made in that quarter. Even so, the Intellectual Capital movement was successful in bringing the importance of information as a key factor of production to the attention of management. [15, 23]

Intellectual capital pyramid in Figure 3 shows all the parts of organization that participates in managing the intellectual capital. Again the three main pillars of IC are clearly seen in the whole context of the organization

Hence in the early 1990s, intellectual capital (IC) was one of the hottest topics in business literature. Businesspeople sought ways to account for intellectual capital. This inevitably led to the question, “How does one measure intellectual capital?” Leif Edvinsson's supplements to Skandia's annual reports helped to fuel the debate (you'll find the Skandia intellectual capital navigator further in this work). But it soon became apparent that however attractive measuring and managing intellectual capital was in principle, in practice it was difficult, and in most cases impractical if not impossible. Because of this difficulty, the enthusiasm for intellectual capital faded. The topic diminished almost to

the point of becoming a footnote, and it seemed as if intellectual capital would be remembered mostly as a parent of knowledge management (KM). [5, 27]

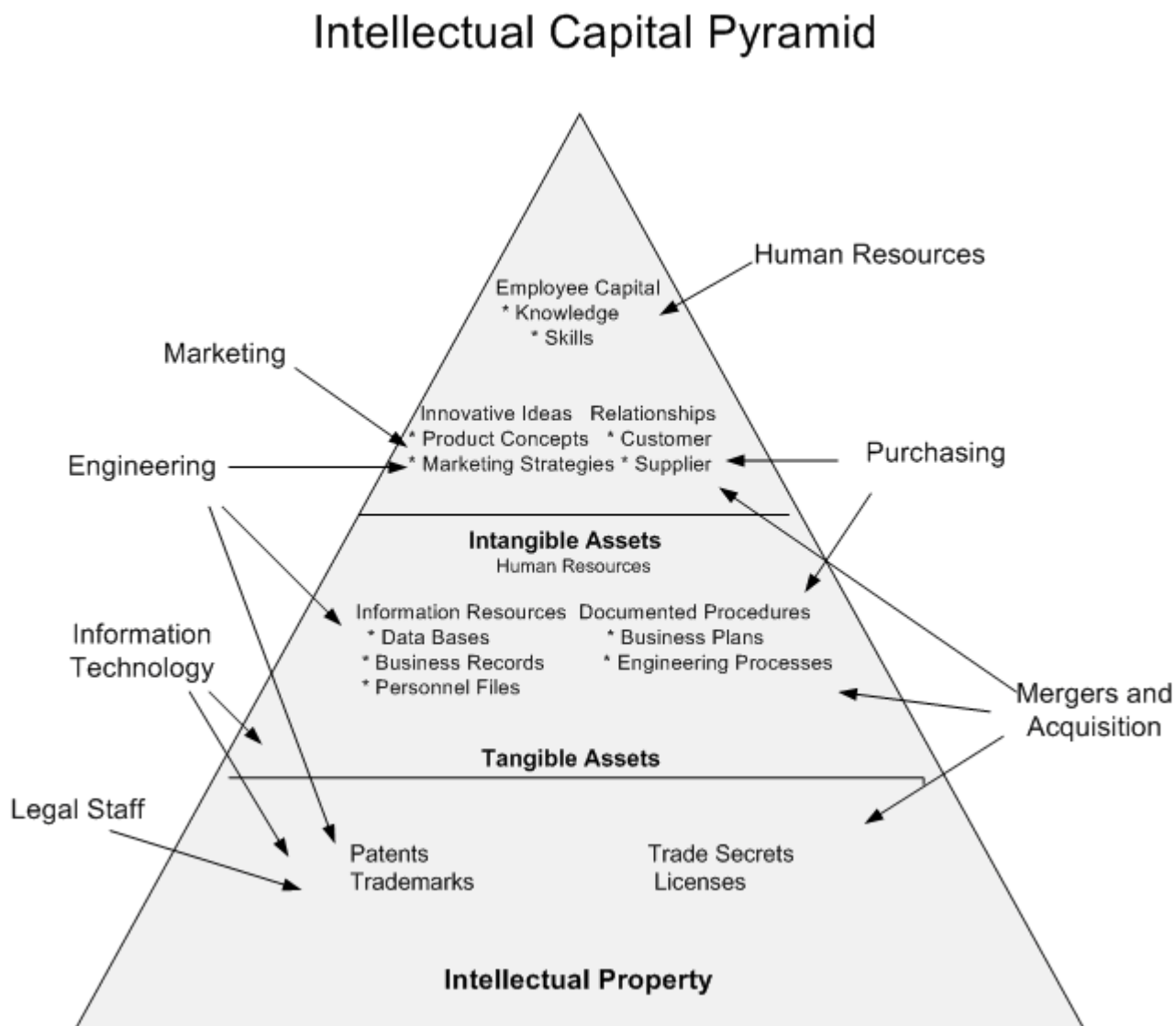


Figure 3. Intellectual capital pyramid [5]

Since then, intellectual capital has returned, not as an asset to be measured, but as an asset to be managed. Now, the concept is called intellectual capital management. The main that caused a comeback of intellectual capital was a great increase of the companies market value in comparison to it's book value, an a need to account for this increased emerged, otherwise it could remain unconsidered and good performance of the company remain unexplained. The patents and their licensing in the 1990's was also an important reason for intellectual capital managing. [10 bakalauras]

And the last but not the least financial accounting and reporting practices have reminded of their inability to show intangible assets of the company. The fundamental objective of financial accounting is to provide users of financial statements with useful information for the purpose of efficient and effective decision making. Outside of the firm, financial reporting should provide information that is useful to present and potential investors and creditors in making rational investment and credit decisions. Within the firm, accounting information is essential for the purposes of efficient managerial decision making - as managers need timely and accurate information in order to carry out the budgeting process and implement effective control mechanisms. Unfortunately, conventional financial statements appear to be rapidly becoming less useful within today's dynamic business environment. A principal factor behind this growing irrelevance of financial statements has been the global transition towards a knowledge driven economy. During the last two decades most industrialized economies have progressively moved towards a knowledge-based rapidly changing economy where investments in human resources, information technology, R&D and advertising have become essential in order to strengthen a firm's competitive position and ensure its future viability. Intangible factors play a predominant role in the ability of companies to innovate and their subsequent competitiveness within a knowledge-based economy. Such assets enable knowledge intensive economies to maintain their competitive position compared to resource or labor intensive economies. This dematerialisation of the economy involves greater investment in intangibles. With the transition to a knowledge-based economy, the principal source of economic value and wealth is no longer the production of material (tangible) goods but the creation and manipulation of intangible assets. In other words, economic growth is not as much influenced by investments in physical capital (ie. land, machinery), as by knowledge which is a critical determinant for the productive application and exploitation of physical capital. Consequently, companies depend on being able to measure, manage and develop their knowledge. [29]

From the very beginning of the interest in intellectual capital business articles added a lot of discussions. Patric H. Sullivan [27] in his article talks about the evolution of intellectual capital management as a discipline follows a pattern that is detectable in hindsight, although to the people involved at the beginning there was no future pattern discernible at the time. Work of Karl-Erik Sveiby [28] in Sweden, addressed the human capital dimension of intellectual capital and provided a rich view of the potential for valuing the enterprise based upon the competences and knowledge of its employees. Many works of Leif Edvinsson [20] explain and tries to show how to measure intellectual capital and how it gets to increased business performance and value, this author made a great input in measuring the intellectual capital. [33]

To summarize, the history of intellectual capital clarify why it became popular during the years and what were the main motives to start measuring and managing intangibles. The development of IC historically leads to broad and easy to understand explanation of the topic. Intellectual capital is knowledge that can be exploited for money-making or other useful purpose. The term combines the idea of intellect with the economic idea of capital, the saving of benefits to be invested in producing more goods and services. Intellectual capital includes the skills and knowledge a company has developed about how to make its goods or services; individual employees or groups of employees whose knowledge is deemed critical to a company's continued success; and its aggregation of documents about processes, customers, research results, and other information of value to a competitor that is not public knowledge.

1.2. Analysis of Intellectual Capital Structure

Before trying to manage intellectual capital it is important to determine what components makes it up. Intellectual capital includes/encompasses inventions, ideas, general know-how, design approaches, computer programs, processes and publications, as it was mentioned in the pyramid of intellectual capital. Distinguishing between the different components of intellectual capital will help to improve the understanding of what it is, and will hopefully allow us to apply the concept at a strategic and operational level. Some components of intellectual capital are difficult to measure, and the costs and benefits are difficult to quantify. For example, quantifying the value of suppliers' relationships is highly subjective and determining a dollar measure would be very difficult. [1, 29]

Much has been said about the need to link the intellectual capital of the firm to strategic objectives, and a number of companies have been experimenting with intellectual capital management frameworks that attempt to achieve this. From these efforts several methods of managing, measuring and reporting of intellectual capital of a firm have emerged, and each has taken a somewhat different approach. One model of intellectual capital management has been developed by Leif Edvinsson, Hubert St Onge, Charles Armstrong and Gordon Petrash. The model, or "value platform", as it is called, divides intellectual capital into three main components (Human capital; Customer (relational capital); Organizational (structural) capital) that interrelate to form value. The model proposed by these three has different terminology for the parts of intellectual capital than Bontis [2] was explaining in his articles. He has a n opinion that customer capital should be called relational capital, because it

encompasses not only customer relations, but also other relations with society, suppliers, partner, etc. that equally bring value. The Figure 4 below presents three pillars named by Bontis.

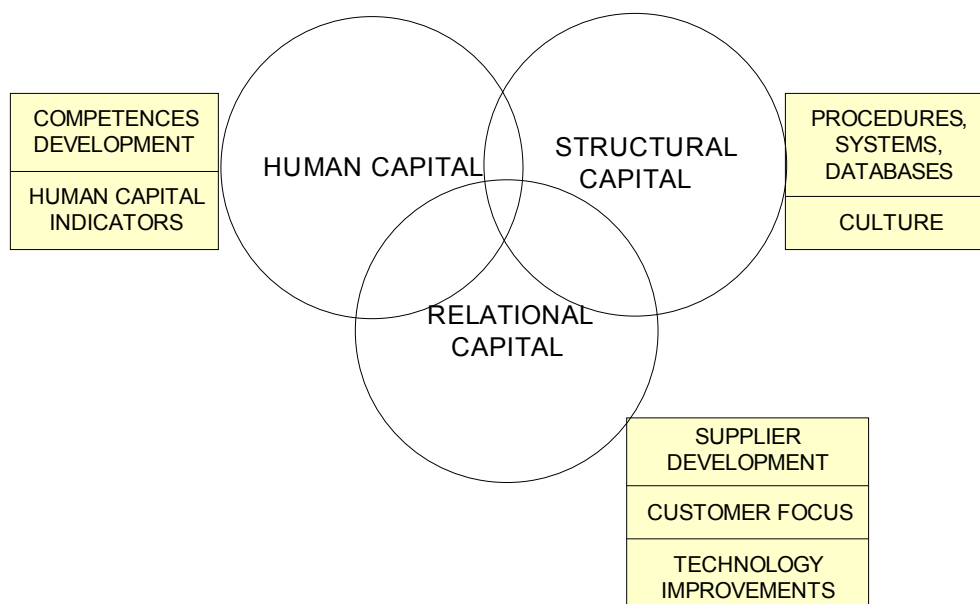


Figure 4. Three main pillars of intellectual capital [2]

One more theoretical model presented by different authors (Edvinsson) has four parts additionally innovation capital is included. Here generation of new ideas, bringing new products and services to the market, expenses for R&D and implementation are taken into account. However structure of intellectual capital in practice varies a lot. Say Danish companies exclude people, customers, technologies and processes under the inputs, activities and effects categories when talking about IC structure in the company. The new Skandia model today talks about structural and human capital only that together can bring value.

As the subject is still in its development stage especially in Lithuanian companies there are many explanations of intellectual capital topic. One of formulations for identifying the value of intellectual capital proposed by most of the resources analyzed is that the value of the company's *IC assets is the difference between the company's book value and market value*. And this value is not presented in annual reports. The Figure 5 below presents the three parts of intellectual capital that are interacting in the process in a different structure than seen before and again this is because of the initial stage of intellectual capital analysis.

Human capital: The knowledge that employees take with them when they leave the firm. It includes the knowledge, skills, experiences and abilities of people.

Structural capital: The knowledge that stays within the firm at the end of the working day. It comprises organizational routines, procedures, systems, cultures and databases.

Relational capital: All resources linked to the external relationships of the firm. It comprises the part of human and structural capital involved with the company's relations with stakeholders (investors, creditors, customers, suppliers, etc.) plus the perceptions that they hold about the company. [13]

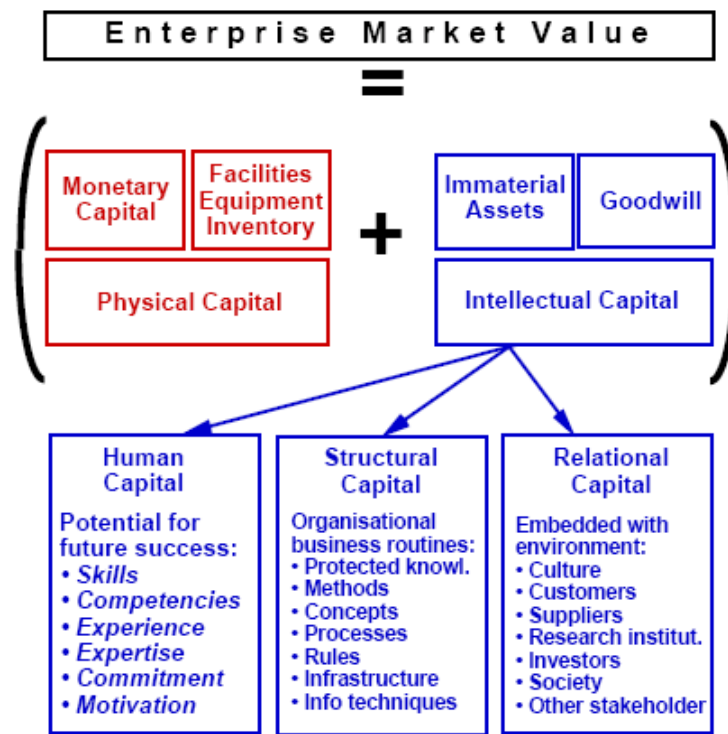


Figure 5. Intellectual capital [1]

Under these three parts fall all the activities and resources of intangibles together with the indicators that coincide. Figure clearly shows that together with the book value (accounted by financial systems) intellectual capital constitutes the market value of the firm. [1] It also lists the points that lie under human, structural and relational capital.

There are two approaches that intellectual capital system provides - a systematic and methodological - for an organization to manage and measure its intellectual capital.

The first component, the most important, is the strategic objective of the organization that guides the direction and indicates what kinds of intellectual capital are important for the firm.

Traditional management looks at technologies, systems, and people separately. However, effective intellectual capital management should treat three of them as an integrated system, with a people focus. Therefore in the centre of an intellectual capital system is the people component. That is the most important aspect of intellectual capital system given the role knowledge workers are playing in knowledge management activities.

Besides the component of people, there are two integrated management and measurement systems. Management systems aim to catch, store, evaluate, and use intellectual capital, while measurements system provides metrics to measure the effectiveness of the management processes. The organization's information technology, organizational structure and culture act as catalytic agents in the processes. Finally, a rewards system should provide employees with the incentive to make their contributions. [8 , 22]

Consequently the practical purpose and aim of managing intellectual is to provide management with a tool for monitoring and disclosing information about their activities and efforts to manage the company's knowledge base. The structure is important when disclosing and monitoring information about IC activities, therefore it is important that exchange between knowledge and intellectual capital elements could happen. That exchange is where values creation happens and it facilitates faster learning and a systematic development of major organizational capabilities. A company makes value when employees (human capital) interact with customers, suppliers, partners and other stakeholders and with the company's structural capital. The quality of these interactions increases or decreases relational capital. Therefore three main pillars: human, structural and relational capitals structuring intellectual capital is a great start for every company and later on company-specific elements possible to adding.

1.3. Intellectual Capital Measurement Models

From all the efforts to manage measure and report the intellectual capital of a company, each has taken somewhat different approach. There is only one thing clear here in order to manage something before one should know how to measure it. Different models developed by different authors distinguish more features and opportunities of intellectual capital measurement and management. However the topic is still developing and researchers are developing their own models rather working on the others in order to general understanding of the field to emerge and the measurement has been always important to businesses, whether measuring income, amount of money, customer's satisfaction,

relations with suppliers or efficiency companies has to measure. It is still important to realize that there is still an opinion that there is no way intellectual capital assets can be measured, therefore many difficulties arise when one or another measurement system is being created.

The measuring approaches for intangibles fall into at least four categories of measurement approaches. The categories are an extension of the classifications suggested by Luthy (1998) and Williams (2000) and described by Sveiby (2001). [18, 28]

- *Market Capitalization methods (MCM)* are mostly used for stock market valuations and are good for illustrating the financial value on intangibles. They calculate the difference between a company's market capitalization and its stockholders' equity as the value of its intellectual capital or intangible assets.
- *Return on Assets methods (ROA)* are popular when comparing the companies in the same industry. In this method average pre-tax earnings of a company for a period of time are divided by the average tangible assets of the company. The result is a company ROA that is then compared with its industry average. The difference is multiplied by the company's average tangible assets to calculate an average annual earning from the Intangibles. Dividing the above-average earnings by the company's average cost of capital or an interest rate, one can derive an estimate of the value of its intangible assets or intellectual capital.

These two methods are great for illustrating the financial value of intangible assets, a feature, which tends to get the attention of the CEOs. Because they build on long established accounting rules they are easily communicated in the accounting profession. Their *disadvantages* are that by translating everything into money terms they can be superficial. The ROA methods are very sensitive to interest rate and discounting rate assumptions and the methods that measure only on the organisation level are of limited use for management purposes below board level. Several of them are of no use for non-profit organisations, internal departments and public sector organisations; this is particularly true of the MCM methods. [10, 28]

- *Direct Intellectual Capital methods (DIC)* encompass mostly narrow value part of a business. Estimate the monetary value of intangible assets by identifying its various components. Once these components are identified, they can be directly evaluated, either individually or as an aggregated coefficient.
- *Scorecard Methods (SC)* can encompass great number of intellectual capital resources and indicators. The various components of intellectual capital are identified and indicators are generated and reported in scorecards or as graphs. SC methods are similar to DIS methods,

expect that no estimate is made of the \$-value of the Intangible assets. A composite index may or may not be produced.

The *advantages* of the DIS and SC methods are that they can create a more comprehensive picture of an organisation's health than financial metrics and that they can be easily applied at any level of an organisation. They measure closer to an event and reporting can therefore be faster and more accurate than pure financial measures. Their *disadvantages* are that the indicators are contextual and have to be customised for each organisation and each purpose, which makes comparisons very difficult. The methods are also new and not easily accepted by societies and managers who are used to see everything from a pure financial perspective. These approaches can generate a lot of data, which are hard to analyse and to communicate. [10, 28]

The two scorecard methods are used more broadly than the other ones, because of the great contribution of researchers. They are arguably the most relevant guidelines in place aiming to provide practical guidance to firms in the process of managing and reporting on intellectual capital. Among existing initiatives, they probably have the strongest institutional and corporate support: [19]

- *Meritum Guidelines* has general aim to improve the policy-making capabilities of the European Union in the realm of science and technology policy, and particularly innovation policy, by providing a consistent basis for the reliable measurements of intangible investments. The Guidelines for the Management and Disclosure of Information on Intangibles are part of the Meritum project.
- *Danish Guidelines* describes how to prepare an 'Intellectual Capital Statement' in practice. It includes in-depth examples from the intellectual capital statements prepared by seventeen Danish companies. The Guideline emphasizes that the intellectual capital statement is an integral part of working with knowledge management within a company, but does not specifically describe a model for knowledge management.

The strength of the Danish Guideline is that they are more user-driven, more practical, more implementable, while the main value of the MERITUM Guidelines is the knowledge and consensus that was built among the different countries which were involved. [13]

Growing evidence supports that the accumulation of intellectual capital is outpacing the accumulation of physical capital as the key driver of competitiveness in the so-called new economy. At the aggregate level, innovation through the development of intangibles has a strong impact on productivity. At the firm level, empirical studies show that innovative firms are financially more robust and generate higher employment. [23] However, lack of comparative analysis makes it difficult to discover the best intellectual capital management model and the intention of every model's authors to

suggest something new to the topic doesn't ease the situation. Again, the practical purpose and aim of managing intellectual capital is to provide management with a unified, consistent, comprehensive, structured and tested tool for monitoring and disclosing information about their activities and efforts to manage the company's knowledge base. Therefore a model proposed in a practical part of this work might be recognized as the tool required by the management of the companies to manage their intellectual capital and take the competitive advantage created.

While researches developed models and explained how complex the intellectual capital management process is, some companies, notably from Scandinavia, have developed their own measurement models. It should be pointed out that all those mentioned derive at least a part of their income from consultancy and therefore have a commercial interest in promoting their models. Elsewhere the development and use of IC models is patchy. Mainland Europe is probably the least advanced, with the UK and US a little further ahead. Pacific Rim countries such as Australia and Japan, on the other hand, have recently made strong advances. The individual company models distinguished (D. Starovic, B. Marr, 2002): Skandia navigator; Ericsson's cockpit communicator; Ramboll's holistic company model; Bates Gruppen Company IQ measurement system. [8, 23]

Skandia navigator. Of all the systems for measuring IC Skandia's navigator model, developed in 1994, is probably the best known, even though it is only implemented in the Swedish part of the organization. It reflects four key dimensions of its business: financial focus; customer focus; process focus; and renewal and development focus. At the heart of these is human focus, which drives the whole model. It can be noticed that the model was developed relying on three main parts of intellectual capital, additionally taking financial information as base for the model.

Lief Edvinsson was writing about the model as of the house, where financial focus is the roof, customer focus and process focus are the walls. The human focus is the soul of the house while renewal and development focus is the platform. With such a metaphor, renewal and development become the critical bottom line for sustainability. All is seen in the Figure 6.

Each of the five focuses has critical success factors that are quantified to measure change. The indicators used for the financial focus are largely represented in monetary terms. Customer focus concentrates on assessing the value of customer capital to the organization and makes use of both financial and non-financial indicators. The measures used for the process focus emphasize the effective use of technology within the organization. They tend to monitor quality processes and quality management systems but also include some financial ratios.

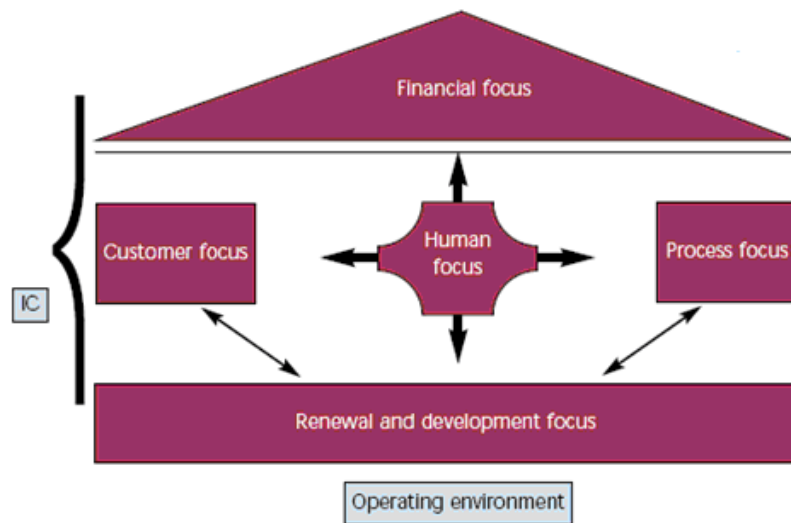


Figure 6. Scandia Navigator. [8]

The renewal and development focus attempts to capture the innovative capabilities of the organization, measuring the effectiveness of its investment in training and its expenditure on R&D. Finally, the human focus includes measurements that reflect the human capital of the organization and how the resources are being enhanced and developed. Measurements from the five focuses can then be recorded and compared from year to year. [8, 20, 35]

Ericsson's cockpit communicator. Ericsson, the Swedish telecommunications company, has developed a commercial product called the cockpit communicator, again based on the balanced scorecard and with five very similar perspectives: innovation, employee, process, and customer and financial. Each is represented as the dials in an aircraft cockpit and each has its own indicators. Following inputs relevant to each indicator, the communicator suggests the actions that will match the organization's strategies. The dials will subsequently show if the company is on target in each perspective. According to Ericsson, the aims of this product are:

- a vision-driven organization, where priority is given to actions that are compatible with the company's strategies; a communicated strategy linked to indicators and actions;
- a balanced focus on past, present and future performance and between short-term results and long-term strategy;
- ability to evaluate and change organizational strategy rapidly in line with performance and changing business conditions and ability to manage and communicate future values. [8]

The model as well as Skandia navigator includes future perspective that is lacking in the financial reports and the long-term goals that was one of the reasons to greater interest of the

intellectual capital, communication to external environment mentioned and easier management decisions this shows the company has knowledge of the IC development and the model proposed is more oriented to disclose the benefits of intellectual capital measurement, while Skandia put more effort to explaining how the part of intellectual capital might be used.

Celemi's intangible assets monitor. International training consultancy Celemi monitors three overall categories: customers (external structure); people (competence); and organization (internal structure). Under each of these interdependent categories, the three key areas of growth/renewal, efficiency and stability are tracked, each with its own performance indicators (*see table 1*).

Table 1. Celemi's entangible assets monitor [8]

Our customers (external structure)	Our structure (internal structure)	Our people (competence)
Growth/renewal Revenue growth Image-enhancing customers	Growth/renewal Organization-enhancing customers Revenues from new products R&D revenues Intangible investments (% value added)	Growth/renewal Average professional competence years Competence enhancing customers Growth in professional competence Experts with post-secondary degree
Efficiency Revenues per customer	Efficiency Proportion of admin staff Revenues per admin staff	Efficiency Value added per expert Value added per employee
Stability Customer satisfaction index Repeat orders 5 largest customers	Stability Admin staff turnover Admin staff seniority (years) Rookie ratio	Stability People satisfaction index Median age of all employees Expert seniority & turnover

Ramboll's holistic company model. As with other Nordic models, Ramboll's holistic company model consists of key areas within which certain performance indicators are managed. These key areas lead to three sets results – customer, employee and societal – and all three combine to produce the financial results. The key areas are values and management, strategic processes, human resources, structural resources and consulting services. For example, the performance indicators for human resources are staff composition, staff turnover competence building. These key performance indicators (KPIs) are then further subdivided. The ones for competence building, for example, are supplementary training expenses excluding salary, the amount spent per course participant and the hours off contributed by employees. [2, 8, 30]

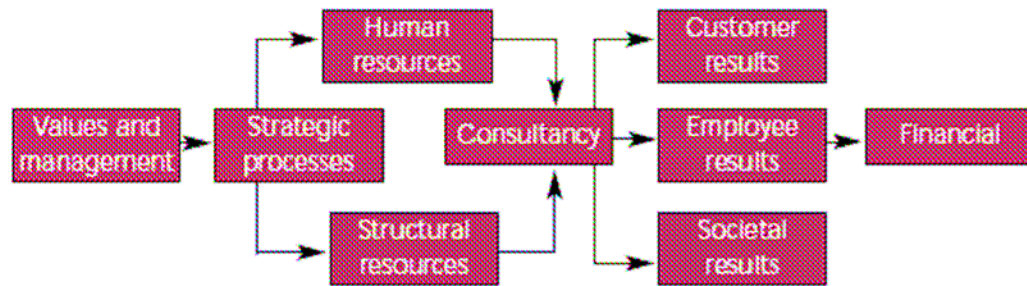


Figure 7. Ramboll's holistic company model [8]

Celemi and Ramboll's model when presented stress the indicators that are used to measure the parts of intellectual capital. Celemi's model distinguishes the environments of the company that has influence to business and competence as the main human capital indicator, while Rambol also includes societal factor not mentioned by any previous founders, probably associating it with external environment of the company besides customers. All the model stress the human capital and it's main input when measuring and managing intellectual capital. The table 2 provides list of possible human, organizational and customer capital indicators, but measurements will always be company-specific.

Table 2. Ramboll's holistic company model list of indicators [8]

Human capital indicators	Organizational capital indicators	Customer capital indicators
*Revenue generated per employee *Number of senior positions filled by junior staff *Recruitment, development and training spend per employee been consulted *Employee satisfaction *Average length of service of staff *Staff turnover *Educational level of staff *Staff with professional qualifications *New ideas generated by staff *Value added per employee *Post-training evaluation exercise benefits accrued *Image of company from employee's perspective	*Income per R&D expense *Individual computer links to database *Contributions to database *Upgrades of database *Upgrades of SOPs *Value of new ideas *Ratio of new ideas generated to new ideas implemented *Number of new product introductions *New product introductions per employee *Proportion of income for new products introduction *Number of patents *Average length of time for product design perspective and development *IT expenditure as a percentage of administration spend	*Growth in sales volume *Revenues per customer *Proportion of sales to repeat customers *Customer satisfaction *Effectiveness of ad campaign *Brand loyalty *Brand image *Product returns as a proportion of sales *Customer complaints *Reputation of company *Proportion of customer business that your product or service represents

Bates Gruppen Company IQ measurement system. Bates Gruppen is the Norwegian arm of Bates Worldwide and part of the Cordiant Communications Group. It has recently proposed a method that consists entirely of non-financial measures. The CompanyIQ allows a company to score its knowledge assets against those of a similar organization.

- Stage one: identify why customers buy from your company as opposed to a rival. This is best done in a day workshop in which management select between eight and 12 attributes – for example, rapid response or good design. The final list is sent to customers and employees who rate each attribute twice, once for its value to customers and then for its uniqueness. A scale of one to seven is used. The results are plotted on to a two-by-two matrix. Any attributes that make it into the top upper-right quadrant – for example are high on value and uniqueness – will be explored further.

- Stage two: identify the intellectual assets that produce star attributes – Bates Gruppen has identified 100. Ideally, these should be divided as equally as possible between human, customer and structural IC assets. All of these assets must either be measurable in absolute terms, for example, training expenses, or capable of measurement using scales, for example, customer satisfaction. At least 60 per cent of the assets identified should be comparable to data from reputable benchmarking studies or from the PIMS database – a huge repository containing data on items such as quality for thousands of companies.

- Stage three: it is now possible to calculate your CompanyIQ. Scores on the 100 selected assets must first be weighted for relative impact on profitability (available from PIMS) then compared with similar companies on the chosen database. Bates Gruppen has selected a median score of 100. [8, 23]

The process does not stop at stage three. As with any measurement system some form of feedback has to be built into the system for a company to remain competitive. The strength of assets within the 100 can be identified and weaker ones improved. This method is more than just a measurement system. It requires an organization to identify its highly valuable, unique capabilities and the intellectual capital assets behind them. While calculating its IQ, a company may find it is producing goods or providing services that are similar to those of a competitor or contain features that add little value to customers. This will leave the company with a ready-made list of indicators, so allowing it to take action that has a direct impact on its profit maximizing capabilities. This system requires a great deal of work initially, including gathering data from employees and customers who may be unwilling to participate or who may provide hastily compiled information of little use. It may also be difficult for a company to divide its knowledge assets equally between the three types of intellectual capital, meaning that some are incorporated to make up the numbers while others are excluded. The suggestion

that at least 60 per cent of the indicators are comparable to those from other companies still leaves a lot open to subjectivity. [2, 29]

To summarize, different methods suggest evaluating intellectual capital using different measures. That is because the concept of measuring intellectual capital is still very young, it is hard to assess the measurable intellectual capital assets and every researcher wants to prove their correctness of their view, that is build on their works. It is possible to manage only the elements that can be measured expressed in one or other measures, therefore if one wants to manage intellectual capital corresponding measurement system is necessary. And traditional accounting system does not work here. As this filed will further develop maybe more unified approach will appear. It is important for the development of intellectual capital to build on each researcher's work so that a common and general understanding of the field can emerge.

1.4. The Reasons to Manage Intellectual Capital

Traditionally, the only intangible assets recognized in financial reporting statements were intellectual property, such as patents and trademarks, and acquired items such as goodwill. Although it is still not possible to assign monetary values to most internally generated intangible assets, they nevertheless need to be considered if the process of value creation is to be properly understood.

Failure to do so can have damaging consequences at all levels. For an individual firm, not understanding how value is generated can lead to inefficient resource allocation. It means the company does not fully understand its business model and may therefore be unable to assess the value of future business opportunities. On a wider scale, it can lead to anomalous market behavior: if the markets don't get the information they need through "official" channels they may resort to rumors and speculation, which could lead to volatility. [26]

Intellectual capital management is about the non-physical and the non-financial resources of the company, how they are built and retained, how they contribute to value creation; and how these aspects of the company are described and assessed in terms of value to customers and clients. [23] Much is written about necessity to link intellectual capital of the firm to the mission and strategic objectives, and a number of companies have been experimenting with intellectual capital management frameworks that attempt to achieve this. Danish software engineering company [33, 35], one of the pioneers in the field of intellectual capital, distinguished internal and external causes to measure intellectual capital [10]:

- o *Internal reasons:* businesses make their knowledge resources and key competency areas visible, and monitor management's efforts to develop these. Also, management is able to establish a new basis for deciding about the firm's future. Important here that working with intellectual capital is not something that is done at the top level, but also involving other employees, that improves everyday performance. It has created initiatives to share knowledge including a mapping of competencies and, heightened attention to the development of competencies, mapping of processes and introducing knowledge agents and mentors. IC measurement is also a base line for justifying investing in knowledge management activities.

Intellectual capital is most importantly a tool for management to improve a company's performance. The most important areas where measuring intellectual capital can add value internally are: assisting in strategic choices, analyzing changes both internally and externally, resource allocation, and motivation of employees. Employees that are a part of the process will more easily develop an understanding of the firm's goals and visions; it will increase the possibility of getting everyone to work in the same direction.

Research has shown that employees feel motivated when their value for the firm is documented (Danish Trade and Industry Development Council, 1998). Their everyday performance is improved because they are recognized and highly appreciated.

It is important to understand that it is not a goal to manage intellectual capital just for the sake of managing. Managing intellectual capital should be a part of a knowledge-focused strategy where the goal is to clarify and take advantage of the benefits mentioned above. [10, 12]

- o *External reason:* businesses have a possibility to present themselves to customer and employees, and to co-operating firms and other interests, in an "interesting" way. Present the reliable information (true abilities) concerning both current company's situation and its potential for the future. This important in competitive environment to decrease the gap of knowledge (of strengths and possibilities) that stakeholders get from company itself and the surrounding. Possibility to attract new team members and get network relations to series of firms interested in competency development.

An analysis of a company's intellectual capital should be able to give external stakeholders the external view of a company that reflects the true abilities of the company. One critical area is the company's ability to reach its goal. There has, due to the changes in the competitive environment, arisen a gap between the knowledge that a company has about itself and the information that the surroundings get. The idea is not to provide the external stakeholders with as much information as

possible but rather to provide information that can increase the awareness about a company's strengths and possibilities.

Measuring and reporting intellectual capital is not meant to be a substitute for the traditional measurement- and accounting practices, but rather as a supplement. If intellectual capital reports are publicized together with the traditional financial reports, external stakeholders would have a better foundation and ability to make the right decisions concerning that company, whether these stakeholders are potential investors, government, credit-firms, customers, potential employees, or competitors. This will to some extent close the gap between internal and external knowledge about the company's abilities. It is of course important not to disclose information that might harm the competitiveness of the company. [3, 10]

If to see the whole picture from the management side of view there might be named couple more reasons why managers should want to manage the intellectual capital: *asset* (provides a basis for company valuation), *action* (stimulates management focus on what's important) and *benefit* (as a base line for justifying investing in knowledge management activities) focus here play the role. The following main areas of benefits here are:

- improvements in information provided to shareholders, supporting investment,
- increased information to support and guide decision-making,
- support and provide guidance in the management of human resources,
- support and provide guidance in the management of customer relationship. [22]

In conclusion there can be little doubt that looking beyond the assets reported in financial statements should be a critical exercise for every organization wholly or partly dependent on intangibles for its value creation. Finance professionals should be at the forefront of this process, using their skills and expertise in measurement and control to develop systems capable of accommodating intellectual capital. The main motives to distinguish intellectual capital as an internal management tool and as an external system for reporting intangible data are ease in decision making concerning human resources, customer and supplier relations, systems integration, etc., information and guidance for the management. It is important for company to manage to use and to take advantage from the reasons described.

1.5. Intellectual Capital Management Processes

When it comes to the management of intellectual capital the hardest is to answer a question whether intellectual capital can be managed in one or another organization.

According to researchers the management of intellectual capital involves: [19]

1. Identifying key intellectual capital which drive the strategic performance of an organization;
2. Visualizing the value creation pathways and transformations of key intellectual capital;
3. Measuring performance and in particular the dynamic transformations;
4. Cultivating the key intellectual capital using knowledge management processes;
5. The internal and external reporting of performance. See Figure 8.

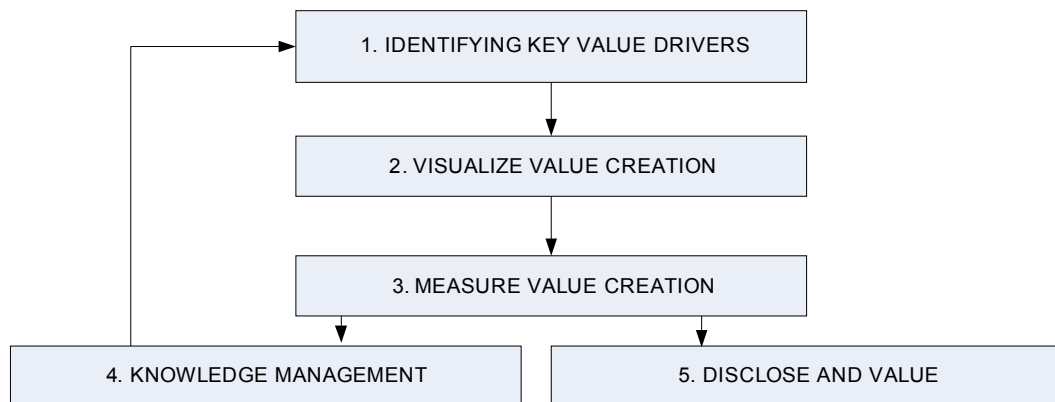


Figure 8. Managing the Intellectual Capital [19]

The first step is to identify the key IC resources in an organization. The traditional starting point is the strategy in which organizations identify the most important resources, especially the knowledge resources (see Figure 8), in order to achieve their strategic objective. Advocates of the resource based view of the firm, such as Penrose (1959) and later Wernerfelt (1984) and Barney (1991), view the set of organizational resources as drivers for the strategy development. Either way, managers have to identify the IC that drives the value creation in an organization. IC resources might include human resources (skills, know-how, competence), stakeholder relationships (customer relationships, licensing agreements, distributions agreements), and organizational resources (systems, processes, organizational culture, management philosophy, intellectual property, brands). Closely related to intellectual capital are the physical resources (buildings, physical networks) and financial resources (investments, cash) that act as enablers to value creation. [5, 21]

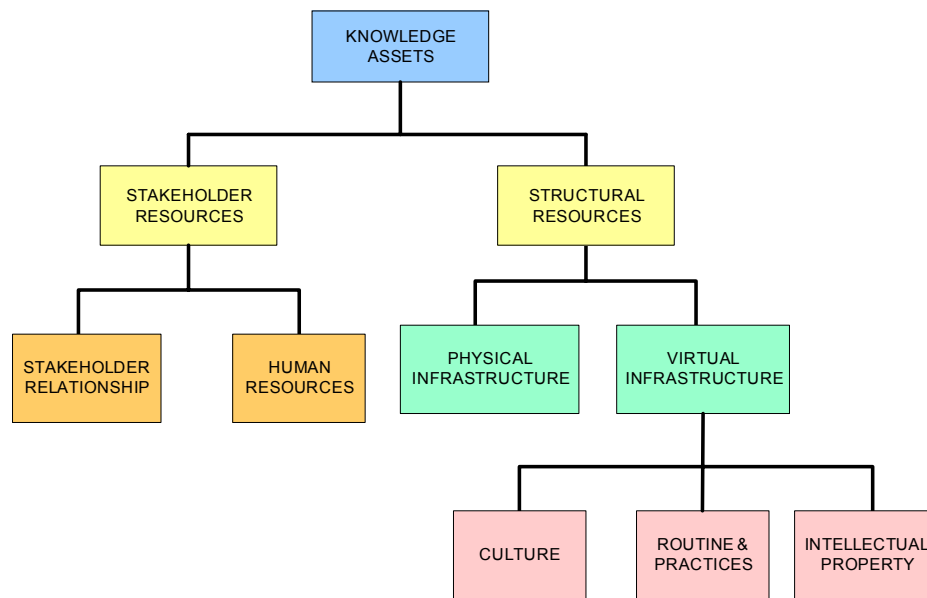


Figure 9. Classification of Knowledge Assets [19]

The second step is to visualize how intellectual capital helps to achieve the overall strategic objectives of the organization. This visual representation of causal relationships or transformations in maps is described by researchers as strategy maps, success maps and as Navigator building on the original work of Edvinsson and Roos in the Skandia IC supplements. Such maps are representations of the business logic and they show the assumed value creation pathways that will lead to the achievement of the strategic objectives and satisfaction of key stakeholders. When organizations have mapped the value creation pathways they can develop performance indicators that help them to understand whether the organization is successful in implementing its strategy. Building measures around the business hypothesis allows organizations to test the assumptions about how the business works. The intellectual capital management phase will use the insights gained from identifying, mapping, and measuring knowledge assets. At this stage managers decide whether to cultivate and nurture the existing IC using knowledge management processes or whether the assumptions of value creation were wrong in which case they have to go back to step one and identify the real drivers of success. The performance capacity of the company is based on the knowledge of its people as well as on the collective or organizational knowledge. This explains why companies are thriving to become learning organizations pursuing the objective of continuous development of their knowledge assets. The important strategic role of knowledge has lead academics and practitioners to define concepts, approaches and tools to make intellectual capital an identifiable and manageable resource. [19, 21] Figure 10 below presents the intellectual capital management visual profile for better understanding of what was mention before.

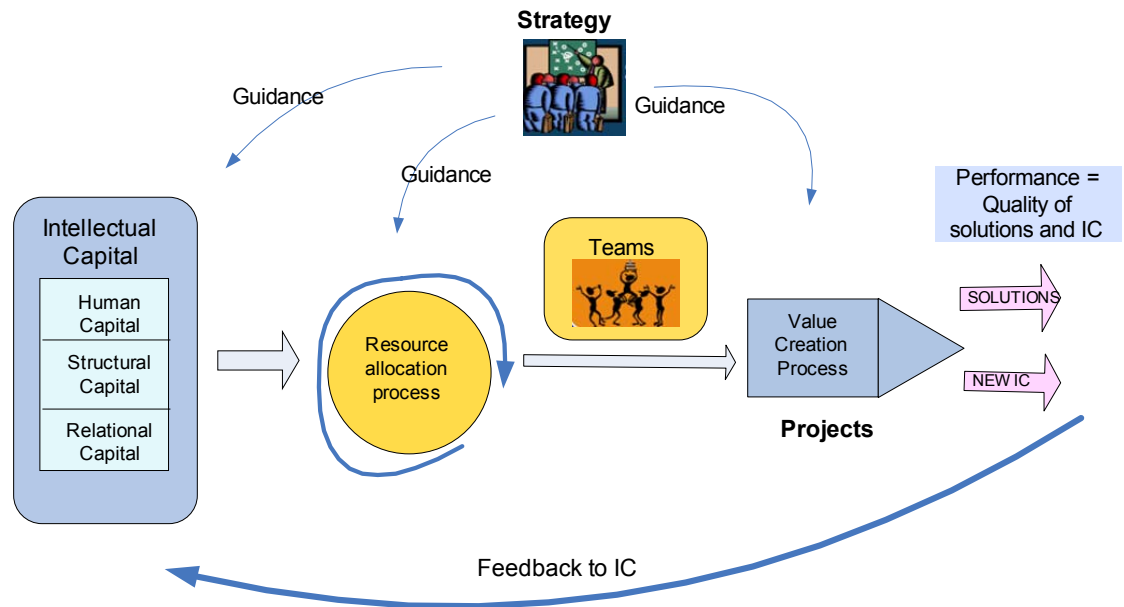


Figure 10. IC Management Profile [25]

Hence management of intellectual capital is not as easy because of still development stage of the subject. Measuring, managing and reporting intellectual capital is expensive, requires time, additional effort, knowledge and resources to manage it in right way. The management of intellectual capital also requires convincing people why it is necessary, conversely than traditional financial accounting. Accounting reports are becoming less and less relevant because they do not account the intangibles, but they are understandable in one way by everyone. This could not be said for intellectual capital measures and reports. It is still not clear how the measures should be interpreted when many qualitative variables are used that is managing intellectual capital becomes more difficult. However intellectual capital is hard to manage not only because of the initial stage of its development but also the historical reason. Accounting rules, although revised on a regular basis, were initially designed for assets such as plant or machinery – tangible things that represented a source of wealth during the industrial age. Second, some intangibles are hard to measure. Creativity, for example, is at the heart of a knowledge-generation process yet is essentially an unpredictable process with unpredictable outcomes. It can manifest itself in many ways. For companies such as Sony and 3M, product and process innovation play a key role in market differentiation. This leads us to the third problem: the idiosyncratic nature of IC. What is valuable for one company may be worthless for another. This has resulted in diverse measuring systems that make comparability across companies and sectors difficult. Finally, intellectual capital can have two dimensions. The Meritum guidelines distinguish between

intangible resources and intangible activities as a way of highlighting IC's static or dynamic character. [13]

- The intangible resources of a company, a static notion, can be measured at any given time. Thus worker competencies (human capital), intellectual property rights (structural capital), customer satisfaction or agreements with suppliers (relational capital) would be considered under this category.
- Intangible resources can also be analyzed in a dynamic sense. Companies are undertaking activities to acquire or internally produce intangible resources, to sustain and improve existing ones and to measure and monitor them. These dynamic activities thus imply an allocation and use of resources that are sometimes not expressed in financial terms and, consequently, may or may not appear in the corporate financial reports.

This dynamic nature of IC means that its individual components are often not valuable by themselves but work only as a system. In other words, it is the intellectual capital elements interacting that generate value for companies. For example, a company may have good programming skills that enable it to build software. However, they might be worth little unless accompanied by a strong distribution network, loyalty and commitment from its employees and a powerful brand name. This dynamic combination of intangibles is often the recipe for success in companies such as Microsoft, where the value of its intellectual capital is more than the sum of its individual parts. [8, 25]

Consequently, intellectual capital is recognized as a key strategic asset for organizational performance and its management is critical for the competitiveness of organizations. The processes of intellectual capital management: identification, visualizing and knowledge navigation, measurement system, development and reporting have to be used in order to provide desired value. Despite the issues that some intangibles are hard to measure, idiosyncratic nature of IC and that diverse measuring systems make comparability across companies and sectors difficult the earlier businesses recognize that IC management processes can bring value the earlier they can bear the results.

2. Development of Intellectual Capital Management Model

2.1. Comparative Analysis for Development of Intellectual Capital Management Model

Despite all the issues intellectual capital is being managed in many companies around the world. All of the models and measurement systems presented in earlier parts of this work are being

used and introduced to internal and external environment of the business and certainly bring greater results and competitive advantage. The most common reasons for managing intellectual capital are traditionally to improve management control, to value a company or to guide a decision that has financial implications.

Considering the reasons of intellectual capital management, the model presented in third part of this work was developed on the base of comparison of other models and distinguishing their best features. Interestingly, many IC models have similar constructs and measures that are merely called differently. For example, human capital (Skandia Navigator) is also called human-centered assets (Technology Broker) and competence of personnel (Intangible Asset Monitor). This re-labeling of similar terms can be seen as both positive and negative for the intellectual capital management. From a positive side, it shows that researchers are narrowing their frameworks and focusing on important concepts that are consistent across perspectives. However, since the field is still in its embryonic stage, no one is willing to give up their own view and build off each other's work. Perhaps, this will change with the time, when the subject will further develop and the desire for more valid and general measures emerges. It is important for the development of this field in the close future to build on each researcher's work so that a common set of definitions can be used. [2, 29]

Existing methods largely distinguished by closed processes (industry – Skandia, routine offices, etc). An IC-Index is very much context specific and is therefore is limited in its universality among companies. Celemi model might be only developed in the company that has very similar culture to Celemi. Trying to develop a model it is important not to tie it to any industry or specifics, managing and reporting intellectual capital should be adapted to each company's needs. Thus each company should develop its own process, relying on models present and using them as guidelines in order to make processes comparable with other companies, like financial statements and bringing intellectual capital to unified system.

In the Danish Guideline an intellectual capital statement is part of the process of knowledge management in the company. It reports on the company's efforts to recruit, develop, share and strengthen its knowledge resources with the aim of creating value and achieving better results in future. This approach concentrates on enhancing knowledge resources that means human capital of the company, while structural and relational capital is build up on it. This is differently in Skandia's model where relational capital is recognized in creating value. Skandia also provides a broad coverage of organizational structural and process factors with its focus on process and renewal and development contributions to organizational value that has not been attempted before. While intangible asset monitor approach again states an assumption that people are the only that creates structures in the company that

are a part of intangibles in the organization. Meritum guidelines define intellectual as the combination of the human, organizational and relational resources of an organization; it is the connectivity between these three elements that– if organized properly – produces value. Hence different approaches put different weight on the parts of intellectual capital and distinction of what creates value.

It is also important to notice intellectual capital management results should be provided to both internal and external users. The Danish Guideline concentrates on external reporting because that is the way companies communicate with clients (actual and potential) and other interested parties, leaving internal users a little aside. The models also differ by assigning intellectual capital measures to financial values. Celemi model is the one that measures growth of IC indicators but does not assign financial values to it, stating that financial values will come along and the value from intellectuals is innate. While EVA is a financial measurement system that seeks to properly account for many important factors and their trade-offs involved when creating value. [4, 9]

The intangibles measuring approaches best suited for the measuring motives are:

1. Monitor Performance (Control). Best are Baldrige award-type of performance indicators and KPIs
2. Acquire/Sell Business (Valuation). Best are Industry rules-of-thumb (\$ per click, \$ per client, brand valuation)
3. Report to Stakeholders (Justification, PR). Best are IC supplements, EVA, Triple-bottom line,
4. Guide Investment (Decision). None of the intangibles approaches can beat traditional Discounted Cash Flow
5. Uncover Hidden Value (Learning). Best are scorecards and Direct IC methods. [2, 28]

No one method can fulfill all purposes; one must select method depending on purpose, situation and audience.

Consequently important differences are about *value creation*, how *the concept of knowledge* is apprehended and the *reporting and categories* used for indicators when disclosing information.

In the Danish Guideline value creation is related to the value in use of services and products for the end-user. Through the knowledge narrative the value in use is spelled out, i.e. the user benefit of products and services, and how the company functions to deliver this. Meritum Guidelines treat value creation in terms of the broader stakeholder value – or more specifically in terms of shareholder value as defined in Sveiby's Monitor. The Monitor finds that the company should be seen basically as consisting of knowledge in a broad sense and that the manager's job is to develop and manage this knowledge. Knowledge (or intangibles) is the wealth of the company, and it is possible to create superior shareholder value by focusing not only on the company's tangibles but also on its intangible

assets. The Meritum Guidelines stress value creation as taking place in the *connectivity* between the different categories of IC, emphasizing that value creation should be made for the benefit of stakeholders.

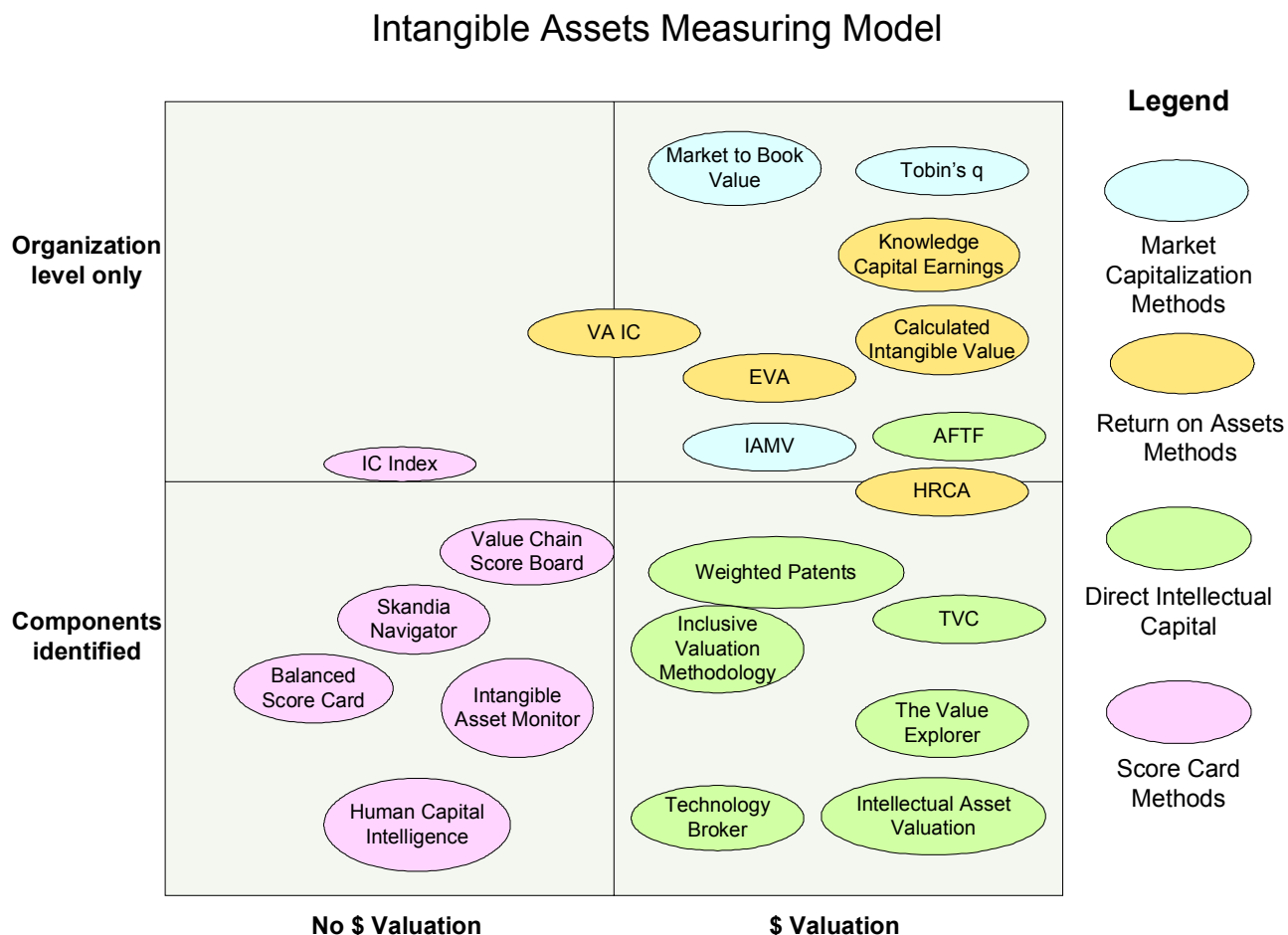


Figure 11. Intangible Assets Measuring Models [28]

IC reporting is about explaining and describing what knowledge means to your company. As such knowledge is a main thing. All the approaches see intellectual capital as action-oriented and company-specific, working differently according to the way in which each company combines and packages its knowledge resources. The Danish Guideline, the Monitor stresses the expertise of the individuals – the professionals – as the most important factor. In the Meritum approach the knowledge concept is not defined as such – but it is the critical drivers or intangibles which provide the competitive advantage. And intangibles (or IC) are the combined human, organizational and relational resources of an organization.

All models need data, numbers of indicators, and appropriate definitions and descriptions to make them work. The categories for intellectual capital differ but basically not that much if one looks at the categories suggested for a company to identify and measure its IC. But even though it is hard to draw a thick dividing line between them, the measuring turns out to be very different. In the Danish Guideline, the knowledge narrative and the management challenge define what should be measured, and determine which indicators to include. It suggests that categories of such indicators should include customers, employees, processes and technology, and that what should be measured is the constellation of resources, the activities to qualify them, and the effects. The Monitor strongly implies that the fewer indicators, the better. This approach involves grouping intangible assets as employee expertise, internal and external structures with pointers to growth and renewal, efficiency or stability. Identification of indicators should be determined by strategy and purpose (external/internal reporting) and with reference to those individuals most likely to be affected by the measures. The Meritum Guidelines are prepared not only for external but also internal use. The indicators are the visualization of what the company is doing with its intangibles and they should allow the readers of the IC Statement to assess how well the company is fulfilling its objectives. There is presently no fixed set of indicators predetermined as necessary for an IC Statement. They should also refer to the three categories of IC (human, structural and relational capital), and distinguish, whenever possible, between resources and activities.

The conclusions of comparative analysis allows to remind that the various approaches to intellectual management deal with how to make systematic measurement of a range of intangible assets – each of them using a set of intellectual categories and indicators. Hence, with the purpose to fully and acceptably interpret the value brought by intellectual capital scorecard methods should be used, because they are not linked to financial values, specific industries and takes into account many IC indicators, therefore it is quite easy to use (what is important in the development stage of the topic), the most of researches analyze scorecard methods as they are most frequently used by foreign companies therefore are not only theoretically but also practically analyzed and finally these methods are up-to-date therefore more and more attention are paid to it. These procedures and techniques are mostly designed to provide a long-term perspective: they are forward-looking management tools, serving to highlight and advance the strategic goals of the company and to help management keep the company on track.

2.2. Intellectual Capital Management Model Structure and Implementation

The core of the model development is analysis value creation process in a broader context still relying on three main parts of intellectual capital. Relationship and interaction of activities brings to a greater result. The model intended is not based on specific industry or company it is broad – based applicable. While making research and analyzing all the advantages and disadvantages of the different approaches, the two most attractive for the topic analyzed were chosen and mainly relying on scorecard - “The Danish Guideline” and “The Meritum Guidelines”- approaches, a model to measure intellectual capital was developed. Intellectual capital management model aims to articulate and realize the company’s strategy for providing the right products and services to its customers. It reports on the company’s efforts to recruit, develop, share and strengthen its knowledge resources with the aim of achieving better results in future. The approach being developed defines knowledge as the mean to explain how the products or services supplied by the company create value for users, and what management must do in order to deliver this value. Knowledge is the ability and potential of the company to trade. Therefore practical knowledge is what matters in an IC management process: knowledge of the company that in terms of the value in use can offer its customers through its products or services. Indicators can be general, industry-specific and company-specific.

The point of measuring IC is to understand the aspects of the company that generate value but are not recognized by traditional measurement systems: to uncover the hidden processes of the organization. Intellectual capital needs to be made visible to generate maximum value. Using indicators for this purpose is different from the traditional role of measurement. Finally the intellectual capital management model developed is a combination of the human, relational and structural capitals resources of the organization and the connectivity between these three elements when organized properly produces value.

Remembering the value of IC, it is seen that the model contains both financial and non-financial blocks that combine to estimate the company’s market value. IC management and reporting is not to substitute the traditional financial reports, but is as a supplement, relying and using *FINANCIAL FIGURES* as the base for development. The calculation of the indicators relies on the financial numbers of the company. It is important for a company to analyze the *ENVIRONMENT* of the industry and decide if the management of IC is necessary. Clear articulation of the *VISION* encompasses the identification of key intangibles to reach the objectives. It important for measurements to support vision of the company and decision how to put vision into system of measurement emerges in this stage. The *KNOWLEDGE* here is

defined as the mean to explain how the products or services supplied by the company create value for users, and what management must do in order to deliver this value. The knowledge takes the company's mission as its starting point; participants of Nordika project states that practical knowledge is what matters in an IC management process: knowledge of the company that in terms of the value in use can offer its customers through its products or services. Also *KNOWLEDGE* presents the new ideas of the company that are accomplished by the interaction of the human, structural and relational capital.

SYSTEM OF INDICATORS ties the vision of the company with the core of intellectual capital. In this model are they are the presentation of what company is doing with its intangibles and it allows for the stakeholders to see how company is doing fulfilling its objectives. As the indicators might be general, industry- or company- specific (concerning what is of most importance to a company) they still should refer to three categories of IC (human, structural and relational capital) and give an understanding of the hidden processes of organization that also generate value but are not recognized in traditional measurement. These are non-financial numbers that do not attempt to put a financial figure on the value of intangibles, but instead measure processes or results that are dependent on it. There is a risk here in identifying the key success factors of the organization, too much weight might be put on the part of IC that is not key intangible in value creation process.

The ambition of visualizing the category of intellectual capital and of translating it into numbers has led to the invention of a new category—'indicators'. Indicators are different from the traditional key ratios in that they do not display any value in themselves. What they actually measure is change. Measuring can be used to uncover costs or value creation opportunities otherwise hidden in the traditional accounts. What is the cost of staff turnover? What is the value of the learning that takes place when staff interacts with customers? What is the value creation opportunity lost in having inadequate systems for Knowledge Management? The learning motive promises the highest long-term benefits. Intellectual capital indicators are more qualitatively orientated, but can include specific relevant quantitative indicators. They reflect the position and status of a firm at a specific point in time and are aimed at internal management rather than external stakeholders. Further in this part indicators used for the measuring part of the model are presented. As there is no fixed set of indicators I try to distinguish the ones that are most important and available to use in different companies. They refer to the three pillars of IC (human, structural and relational capital).

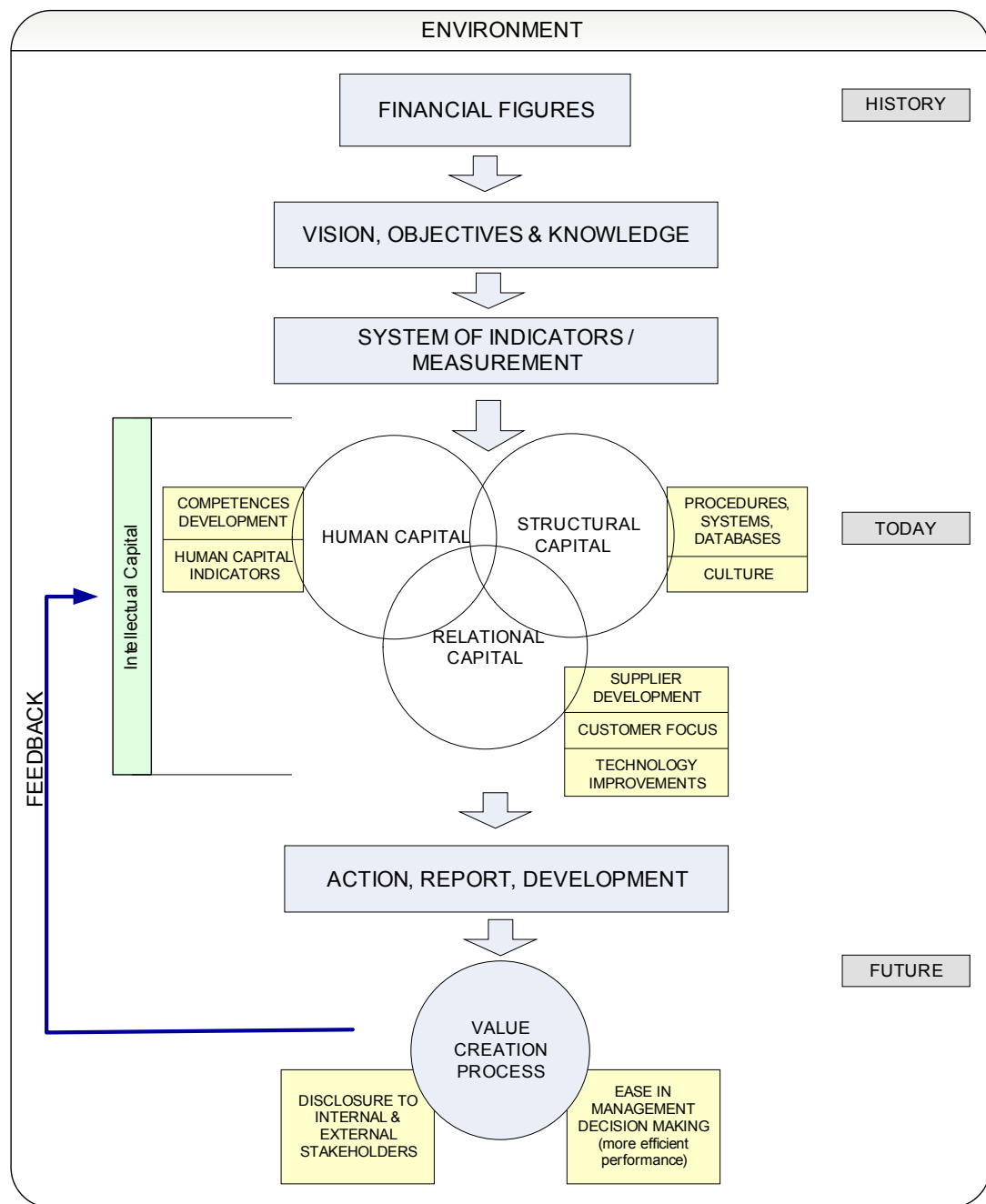


Figure 12. Intellectual capital management model

Human capital. The model is being developed with a notion that human capital is a condition for creating customer and structural capital. But it is important to distinguish that human capital is not equal to intellectual capital, it is a part of it and necessary to create sustainable business value. And there is logical sequence if there is a human capital, structural and relational capitals can be built, so all three together results in financial capital. Company strives to increase the value; the value of human capital is increased when staff members are continuously trained and educated, potentials are noticed

and guided (career plans), opportunities are created where people can learn from each other (team buildings, group sessions, etc) and staff members are motivated (together with intellect leads to innovation).

Human capital indicators calculated in the model are named below and their calculation formulas are presented in the appendices of this work:

- Highly trained people
- Training activities
- Job rotation
- Flexibility-Structural Capital
- Average seniority
- Competency and career planning
- Employee satisfaction
- Staff turnover
- Average absence days

The results indicate how company can handle different kinds of work, how much company is willing to invest in retention of its employees and how it is prepared for future challenges. Job rotation, promotions are indicative of staff flexibility and mobility, development of employee competencies through new challenges, retention and dissemination of knowledge. Also the satisfaction of employees' expectations and requirements is seen. Greater knowledge resources helps to achieve better results in the future so knowledge sharing is important in the organization. Indicators also disclose the company's ability to retain employees, which in turn gives indications about working environment and loyalty that, has an effect on ability to attract new people. The results of indicators help management in such challenges as recruitment, competency development, employees' retention and resigning.

Structural capital. Human capital needs tools to create its relational capital therefore people need access to the infrastructure of structural capital to leverage their efforts in creating relational capital. Structure capital is identifiable through embedded knowledge that organization owns. It determines the communication internally, developments over time, ability to meet future plans and the quality of the processes. Therefore it is important to realize even though individual has high level of intellect, is very motivated to deliver products of the highest quality to the customer, but the organization has poor systems and procedures needed for individual's actions, overall intellectual capital will not reach the best it could.

The indicators for structural capital in the model:

- Internal knowledge sharing
- R&D costs
- Quality certificates
- Upgrades of the Database
- Number of patents
- Internal information sharing
- PCs per number of employees
- IT costs

An effective share of organizational knowledge allows employees to waste much less time for looking information that exists somewhere in organization and improve performance through access to a wide knowledge and expertise base. Internal knowledge sharing typically relates to the management challenge of cross-departmental cooperation. R&D costs associates to the development and level of improvement and flexibility company strives to reach. The indicator PCs per number of employees shows whether the company keeps up to date with technological developments, giving opportunities for exchange of information via the company's intranet and the Internet. The indicator IT costs shows the priority given by the company to having updated technological equipment, supporting the processes that are the platform for employees' work and customers' access to the company. Structural capital provides a lot for the development of the relational capital.

Relational capital. An organization needs appropriately talented people who can satisfy their customers and develop relationships with suppliers before relational capital can truly emerge. A growth in relational capital is created through the individual and collective effects of human and structural capital respectively. A growth in relational capital leads to a growth in financial capital over time, so if the organization's relational capital is strong and built on the enabling foundations of human and structural capital, it provides the basis for a positive change in the organization's financial capital.

The indicators used to depict relational capital:

- Turnover in terms of segments and products
- Company name and image
- Customer satisfaction
- Communication with universities and schools
- The number of working years with suppliers
- New suppliers number per year

Accordingly to establish a value of relational capital it is necessary to consider the value of the knowledge embedded in customers, suppliers and associations in the industry. Customer satisfaction indicator here shows whether customer expectations are met with respect to product quality, ability to deliver, service, etc. This indicator often relates to management challenges such as visibility to customers, development of work processes, ensuring high quality, customer orientation. The external relationship is also covered in these indicators; depicting knowledge of company outside, how deep the gap is between truth and surrounding opinion. Suppliers are also a source of knowledge resources and entry of new suppliers is typically related to management challenges describing how well the company fulfils needs.

As mentioned before human capital resources are of the main importance in most IC models of the companies, therefore the model developed also entails most measures to evaluate human capital in the company. Some of intellectual capital measures are more subjective and they consist of questionings and evaluations that often give only approximate description of the situation. In conclusion the quantitative, objective measures are commonly exact and reliable but they often focus only on a very narrow feature of the value. Vice versa, the more subjective and qualitative measures usually cover the value well but they may not be as reliable or as practical as the objective measures.

In the *ACTION* phase it is important to link the indicators results with the challenges, routines and activities of management, trying to identify the impact of the intangibles. In other words identify that knowledge resources are important factors in company's activities and have impact in efficient and competitive operation and need to be shared and developed. *REPORTING AND DEVELOPMENT* leads to *VALUE CREATION PROCESS*: increased disclosure to company's stakeholder - encourages investors to take decision faster (saves time and increases value of money), increases customer reliance, etc., ease in management decisions – more efficient performance, effective resource management, maximized productivity of knowledge and usage, management information system created that leads to lower resistance to change, faster share of information, continuous learning etc. The value creation process here means to create more value via transformation and improvement of company's knowledge, routines and practices. Model takes into account the *TIME* perspective having in mind that the largest value can be taken from the measurement system of IC when there is a possibility to compare it in time as well as in space.

The model presented in this work gives a structured picture how to accomplish the need of information disclosure to stakeholders, ease in management decisions and potential for the future. Model proposed in this work has some distinctions in the pool of others analyzed in the literature. The greatest advantage of it is that it gives a thorough, comprehensive and consistent view how to manage

the intellectual capital. Model is flexible and not sophisticated. It is not based on specific industry or company and provides step-by-step procedure from intellectual analysis, ideas and goals, through system of measurement that further leads to result solving intellectual capital management problem in a company. Indicators list made is based on most frequently used indicators in the theoretical research. There is a possibility left to diminish or increase the number of indicators depending on the industry or specific company needs. Model is broader than presented by others and attempts to avoid superficiality. That makes it similar to direct intellectual capital and scorecard methods, but also excluding it because of versatility and more coherent parts. As it is important for the development of intellectual capital model was build relying on researcher's work and gives effort for emergence of common and general understanding of the field.

3. Intellectual Capital Management Practice and Model Testing

3.1 Systematic Software Engineering Ltd – Intellectual Capital Statement Practice

In this part of master thesis I analyze Danish company Systematic that is independent and privately owned software and systems company working at world class maturity, with intent to see how foreign companies manage intellectual capital, calculate their indicators and do their statement for stakeholders. It is more easy to imagine how intellectual capital could managed and measured in software company than in retail one but with the time companies in Lithuania will recognize the necessity to talk about their intellectual capital in order to stress competitive advantage.

Company was established in 1985 it is Denmark's largest privately-owned software company with top management as majority shareholders. Headquarters are in Aarhus, with branch offices in Copenhagen and subsidiaries in the UK and the USA. It focuses on complex and critical IT solutions within information and communications systems. These systems are often mission-critical with high demands on reliability, safety, accuracy and usability. Data for the calculation of the indicators and the financial data layout were selected from the yearly reports of the company, and according later described formulas calculated specifically for this analysis. Further information for research was found in the company's website, its annual report and other internet sources.

Systematic's core competencies include:

Management information systems - such as electronic patient records and mission planning systems

Application integration - electronic exchange of information between IT systems

Interoperability - unambiguous data exchange between military units

Data security - exchanging the right data between the right partners

Project management - delivery on time and to the price and quality agreed

Their services include the development of customer-specific solutions, licensing sales of its own products and professional services. The main business areas of Systematic Software Engineering are: defense and healthcare sectors, world-class within military messaging and interoperability with own product suite, complex assignments for selected key accounts, professional services for major public and private companies and specialists in application integration, data security and project management.

The main data taken from annual report of Systematic are:

Employees:

Staff: 348 as of February 2005, of which 51 are in the UK and the USA

71% of all systems engineers hold an MSc or PhD degrees

High employee satisfaction and low employee turnover

Yearly investment in competence development equivalent to 9% of payroll

Processes:

Among the highest certified software companies in the world within process maturity: SEI – CMMI Level 5 certification

Quality control systems certified according to ISO 9001:2000 and AQAP 150 and 2110

Finances:

Group turnover in 2004/05: €29.1m. Export share 43%

Profits in 2004/05: €0.7m.

Equity: €7.4m, equity ratio 38% and no bank debt

Innovation:

Close co-operation with research institutions. Investment in innovation equivalent to 17% of turnover

Five-year sponsorship of Denmark's first Professor in pervasive computing

The customer as a partner:

Focus on long-term relationships with a select number of customers with opportunities for mutually beneficial co-operation. Show the customer respect and have the courage to turn down an assignment if cannot implement it to full satisfaction.

I've chosen to analyze Systematic Software Engineering as a basis to make comparative analysis of companies that have no experience in intellectual capital management and the other that already put some efforts to do it. However both of them are interested in improving its management of

intellectual resources and Systematic might be great example how to work further for retail company and again convince it that it is necessary in today's competitive environment.

The motivation to develop an intellectual capital statement

Internal reason: the firm wanted to make the firm's knowledge resources and key competency areas visible, and to monitor management's efforts to develop these. Also, management wanted to establish a new basis for deciding about the firm's future.

External reason: management wanted to present the firm to customer and employees, and to co-operating firms and other interests, in an "interesting" way.

Effects of the intellectual capital statement/project

Internal: it has created initiatives to share knowledge including a mapping of competencies and, heightened attention to the development of competencies, mapping of processes and introducing knowledge agents and mentors. A system of project management has also been established that introduces a series of "balanced" points of measurement in project-reporting systems.

External: The word "systematic" has become a "name" among research communities, the press and local authorities. The intellectual capital statement has made it possible to attract new specialized IT employees, and get network relations to a series of firms interested in competency development.

Systematic's intellectual capital statements are 16 and 19 pages long, of which the first five to seven pages are an introduction to and a description of the company (including its mission, vision and values), and the last pages are an excerpt from its financial statement. The intellectual capital statement is largely structured according to the model shown in Figure 6. From this Figure we can see that vision, values, objectives and strategies of Systematic are presented first. The company's report states its efforts, and it ends with results. So the inputs are visions, missions and strategies; the processes are statements on people, processes and customers, and; results are financial. The intellectual capital statement is a form of communication with aspects of customer-relations, employee development, customer- and employee-satisfaction, effectiveness of processes, and certain forms of innovation in areas of product development and process improvement.

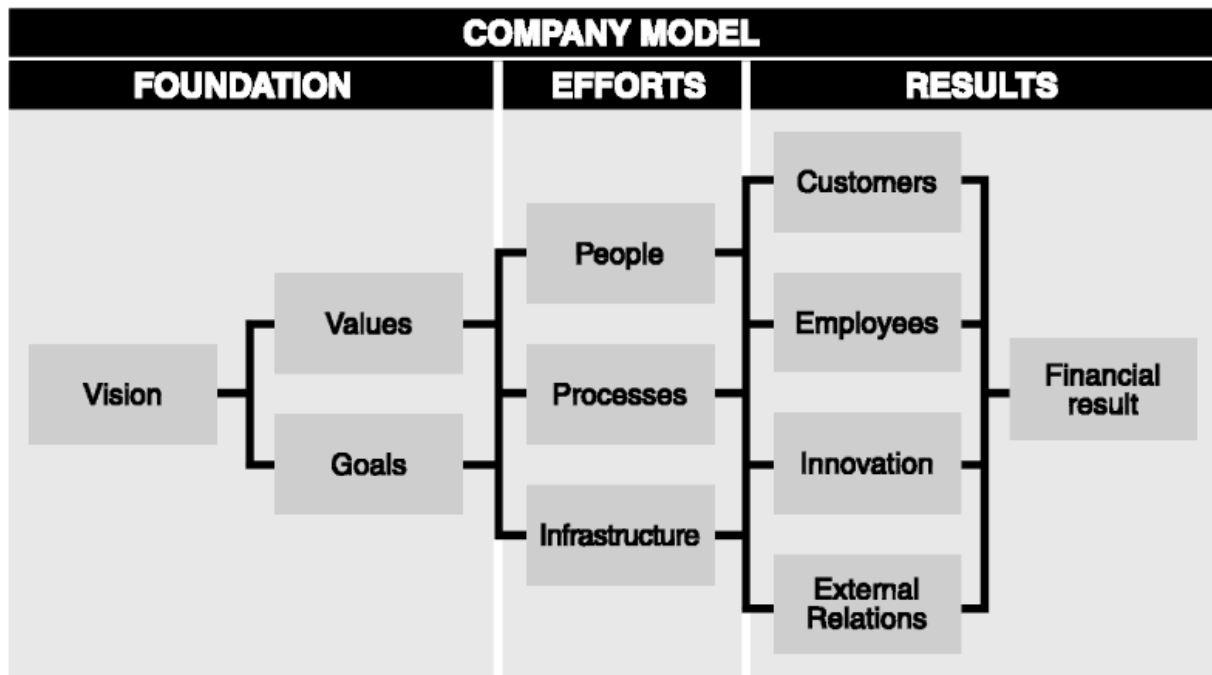


Figure 13. Systematic's model to structure the intellectual capital statement [24]

In its intellectual capital statement, Systematic uses indicators to measure its intellectual capital with an emphasis on employees and processes. For employees, resource and effect indicators are used, while processes are indicated primarily via effects and partly by qualifying activities. The selected indicators focus on effects of processes and on attracting employees, particularly software engineers. Recruitment and the development of procedures that enable knowledge sharing are interrelated. Systematic's intellectual capital focuses on developing stable relationships between employees, technology and customers. [24, 31, 32]

Systematic's challenge is to create a "knowledgeable" and "capable" organization that integrates highly systematized processes and highly qualified employees in order to provide quality products. The indicators chosen in this company present the intellectual capital statement as the table 4 indicates. Tables 3 and 4 show that Systematic has expanded its human resources in software development, just as it invests increasingly in activities which develop them. Also, employee satisfaction increases. Thus, in terms of measures in the employee category, a certain attention to expanding the resource base is in place; and concerns to enhance their value are in place via qualifying activities. The customer category illustrates a slowly changing revenue base giving more space to civil rather than defense-related revenues, even if the number of continuing projects only increases by small steps. As a resource, customers are found in new areas of business segments.

Table 3. Indicators of Intellectual Capital Statement (I)

	Employees		Customers	
	2004	2005	2004	2005
Resources	Number of employees:	257 305	Turnover by products:	0.11 0.14
	Average number of full-time staff:	210 257	5 biggest customers:	70% 81%
	IT employees:	0.80 0.81	Licensed products (% in group turnover)	12% 14%
	Employees having Masters or PhD (%)	60% 70%	Customer durability:	
			0-3 years	15 16
			4-6 years	6 5
			7-13 years	5 7
	2004	2005	2004	2005
Improvement activities	Education days	14.9 11.5	The no. of participants in company's investing.:	28 30
	Education costs (employee per year)	2833 2048	Communication with universities and schools:	2 2
	Project team size	10 13		
	Experience exchange Meetings:	4 4		
	2004	2005	2004	2005
Effects	Employee satisfaction:	92% 94%	New customers no./year:	3 3
	Staff turnover:	0.03 0.04	Recommendation:	85% 92%
	New staff:	63 55		
	Average absence days:	5.0 4.7		

From the process category (table 4) attention is on qualifying activities via heavy investments in product development and a slightly smaller investment in process technology, and the hours invested in development work increase steadily. An integrated part of the firm's knowledge management practice is to look for the best and brightest, and to develop their professional and personal competencies. For processes to work individual human motivation has to be aligned with the requirements of integrated production methods. A third related knowledge management challenge is the development of employees' precise knowledge of users' situations. Part of this is investment in training/employee development and part of it is on-the-job training that helps software engineers understand more of users' business. [31, 35]

So, Systematic is a firm that has developed its resource base in the employee category; it is partly transforming its revenue base making it less dependent on one industry, as it invests heavily in the development of processes and employees. These indicators suggest that the development of project management systems, quality, and on-time delivery are parameters of an attempt to improve processes

and incorporate employees. For Systematic, knowledge resources are enhanced by actions that make the firm attractive to prospective employees, and that allow the whole system of developing, producing and maintaining complex software solutions for certain users to be achievable.

Table 4. Indicators of Intellectual Capital Statement (II)

	Processes	Technology																		
Resources	<table> <tr> <th></th><th>2004</th><th>2005</th></tr> <tr> <td>Internal information sharing:</td><td>100%</td><td>100%</td></tr> </table>		2004	2005	Internal information sharing:	100%	100%	<table> <tr> <th></th><th>2004</th><th>2005</th></tr> <tr> <td>PC per employee:</td><td>1.4</td><td>1.8</td></tr> <tr> <td>Servers no. in network:</td><td>19</td><td>32</td></tr> </table>		2004	2005	PC per employee:	1.4	1.8	Servers no. in network:	19	32			
	2004	2005																		
Internal information sharing:	100%	100%																		
	2004	2005																		
PC per employee:	1.4	1.8																		
Servers no. in network:	19	32																		
Improvement activities	<table> <tr> <th></th><th>2004</th><th>2005</th></tr> <tr> <td>Research cost:</td><td>0.11</td><td>0.15</td></tr> <tr> <td>Average no. of hours for software development:</td><td colspan="2">Depends on the size of the project</td></tr> </table>		2004	2005	Research cost:	0.11	0.15	Average no. of hours for software development:	Depends on the size of the project		<table> <tr> <th></th><th>2004</th><th>2005</th></tr> <tr> <td></td><td></td><td></td></tr> </table>		2004	2005						
	2004	2005																		
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Average no. of hours for software development:	Depends on the size of the project																			
	2004	2005																		
Effects	<table> <tr> <th></th><th>2004</th><th>2005</th></tr> <tr> <td>Quality certificates:</td><td>3</td><td>4</td></tr> <tr> <td>Delivery:</td><td>89%</td><td>92%</td></tr> <tr> <td>Customer satisfaction on quality</td><td>-</td><td>3.9</td></tr> </table>		2004	2005	Quality certificates:	3	4	Delivery:	89%	92%	Customer satisfaction on quality	-	3.9	<table> <tr> <th></th><th>2004</th><th>2005</th></tr> <tr> <td>Employees satisfied with their work place:</td><td>3.7</td><td>3.1</td></tr> </table>		2004	2005	Employees satisfied with their work place:	3.7	3.1
	2004	2005																		
Quality certificates:	3	4																		
Delivery:	89%	92%																		
Customer satisfaction on quality	-	3.9																		
	2004	2005																		
Employees satisfied with their work place:	3.7	3.1																		

This part of the knowledge management challenge looks at the development of customer-relations. The durability may be part of the development of insights that help Systematic to anticipate user needs and to suggest to customers when new software and whole systems are appropriate.

To summarize, company according to the indicators have developed during the year. It has invested a lot to the human capital: despite the lower training days and costs the satisfaction of employees' has increased, also higher investment into development of processes and research were made. Company is concentrating on bigger projects and exchange experience a lot, which leads to more tight culture of teams. Systematic is communicating with universities which reflect external relationships and communications. And the image of company between customers is great, 92% of them are ready to recommend the company. Systematic spent a lot on the research and development to improve the processes and to show to their stakeholders that they are looking ahead, to the requirements of future processes and technology. For all processes in the companies to work, the employees have to be highly motivated, because the requirements for processes are growing.

Concerning these indicators it appears that companies tend to spend more on R&D, than IT, also investments to human capital are made, so the investments in technology are lower, but number of hours for software development tends to increase. Investments and efforts to develop and calculate intellectual capital indicators show that Systematic try to be more attractive to its employees, customers and gain competitive advantage over the competitors. Managements work to reach its challenges for greater companies' futures.

3.2. Proposed Intellectual Capital Model Testing in Retail Industry Companies

Intellectual capital management requires an understanding of the hidden processes of the organization that also generates value but are not recognized in traditional quantitative measurement. It requires a lot of communication and analysis of the content. The qualitative research method was chosen to start the testing of the intellectual capital model in the companies and analyze the environment, mission and objectives and later on quantitative research was also used. Two types of surveys were made, one a written questionnaire [appendix 1] and the answers helped to calculate the indicators and the other abyssal interview [appendix 1] with the personnel department employees to get the data for the analysis of intellectual capital management. The questionnaire send by email to office employees in three Baltic countries was an effective way to get the information needed as they certainly reached people. It contained questions such as age, sex, position, background, job and IT satisfaction, motivation, trainings, seniority and information sharing questions. Very similar questions were asked during abyssal experts interview with other three payers in Lithuania's retail market however not all answers were gotten, as the information is quite confidential and personnel department employees could not say the answers as they did not know them. Some of the researches concerning human capital are not made in the companies as they require a lot of time and efforts. The questionnaire was made following the structure of intellectual capital: human, structural and relational capital questions in order to develop indicators for each part were created.

With the research made in the companies I have explored and analyzed how people store experience and share knowledge with the help of processes and relations. The results of research give better understanding of the subject and explain why companies have to manage their intellectual capital. Even though most of the answers have number expression they are influenced by the experience, priorities and knowledge of employees, not by specific calculations. This makes a

subjective research, with the goal to analyze hidden processes and their impact to monetary value. It is important here to ascertain the causal – outcome relations. It was important to analyze how non monetary resources in the organization are developed and used.

Qualitative research. The survey was started with the retail leader in Lithuania – **MAXIMA**. Abyssal interview method was used and personnel department employee answered some of the questions and shared her view. The turnover of company was 5.1 billion litas in 2007 that is 21% more comparing to 2006. Today Maxima employs over 400 employees in its office and has 226 stores in Lithuania. The number has grown during the year 2007 as the number of stores increased. Being one of the larges players in the market it is also one of the largest employers. Staff turnover in the company has increased and the main reason mentioned by the human resource person was bad recruitments and increasing competition. Today company employs over 25% of students with an intent to grow competent employees and have young team. Company does career planning according to the potentials of employees, more than 60% of the highest level managers were promoted from the specialists, shift managers and others. Training system is created and constantly works every year involving new persons. Training costs per employee were not revealed. Average age of people working in the company is 37 years, as it is Lithuanian capital company not many of employees have international working experience, however during the great expansion to Baltic countries, Romania and Bulgaria the international projects numbers has increased a lot while sharing knowledge and experience. More than 40 administration employees are managers and 90 % of total employees has higher university degree. More than 20 persons are being promoted during the year that shows staff flexibility and mobility, development of employee competencies through new challenges, retention and dissemination of knowledge. Knowledge and experience sharing meetings are being held once per month that assures not only flow of information but also new ideas.

The image for the company is very important in order to have loyal and satisfied employees. According to ACNielsen research that was made inn 2006, Maxima name is the first that a person would name when asked about supermarkets in Lithuania, which also adds value when talking about human and relations capital (see figure 16).

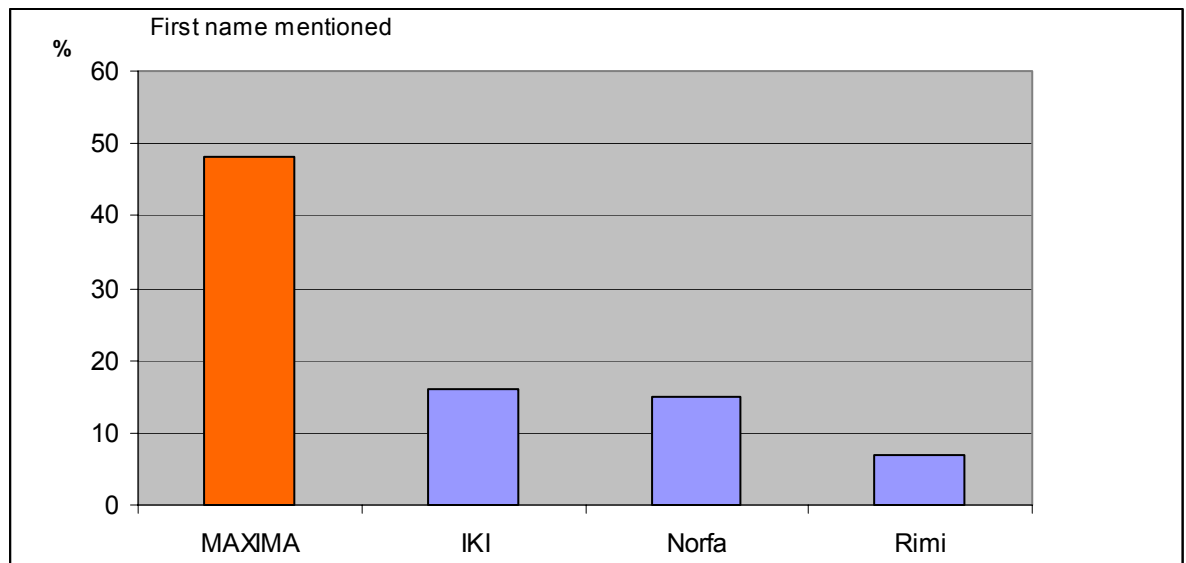


Figure 16. Brand name Knowledge

According to the respondent company invests a lot to new technologies and their implementation. They are buying newest storage equipment, accounting and stock management programs, trade lines are always modernized. However the exact numbers were not disclosed. Almost 100% of administration employees have computers and intranet usage is very wide in the company respondent said and this indicates fast information sharing and saves a lot of time. Great attention is brought to schools and universities, company is organizing various contests and the only one from retailers gives scholarships to pupil. Being the largest retailer gives the best supplier conditions. Company can enjoy the greatest relationships with suppliers and their experience being shared. The number of the largest suppliers in the company is 19 that deliver most of the product to its stores. However company is always looking for new suppliers with an intention not to concentrate on few big ones in order to avoid the risk. Company has 6 strong partners that help to earn customer loyalty, proposing useful solutions. Therefore company has a strong position in customers mind and is one of the leaders when measuring customer satisfaction.

The information gotten is not enough for testing the intellectual capital model, the company was resistant to share its data and analyze its hidden processes, relations and human issues, mainly because of required data disclosure and time needed to develop research deeper.

The next abyssal interview was made with **IKI** human resources employee Jurga. The company is working 16 years already and has over 200 administration employees and 201 stores in Lithuania. IKI differentiates itself with the great attention to customer and highest investment to technologies and service systems. Their investment to technologies was 2.2 billion litas in 2007 that is 32% more than in

2006, it also spent over 40 million litas to logistics center project in 2007. Company the first in Lithuania that presented self-service cash desks. This way they do not only serve customers better but also ease their employees work by increasing job satisfaction. According to respondent company is also proud of the newest warehouse management system that takes many processes into account and allows effectively manage not only flow of goods but also human resources in warehouse. This way they assure integrity of processes and highest quality orders implementation also establishes a physical framework for its office employees to perform in their jobs. Technological updates in the company, company's investment in office equipment which leads to employees' satisfaction with their work place. And this is very important because it shows how fast the knowledge and information is shared in the organization for more productive work. Intranet is available in the company and widely used according to the respondent, this way daily tasks and problems are solved faster. It also serves as great information source for newcomers. The practice of experience changing meeting is also present in the company that assures knowledge sharing between employees. The concentration on structural capital is obvious as this is what company is mostly proud of.

Investments to employees' development are not as significant as investment to process development. However, every person has a possibility to increase their knowledge and develop their competence in trainings. Career planning exists in the company only for highest potential employees and managers. Employees are satisfied with their work place and IT equipment and this is not a surprise remembering their investments. Easier work makes employees happier and more satisfied with their job this leads to higher customer satisfaction, which is company's priority number one. Better processes leads to faster and higher quality customer service, more skilled employees to more satisfied customer, this is what company seeks, the respondent said. The company was the first that presented customer loyalty program. The EPSI (European Performance Satisfaction Initiative) [42] press release confirms the company's efforts to satisfy its customer and gain loyalty, as it is an undoubted leader in EPSI/Loyalty in three Baltic countries, boasting with 79 EPSI scores and 80 scores for Loyalty (both from 100) in Lithuania (see figure 17).

One more player in the market is **NORFA** retail chain. The abyssal interview was not as successful as with other two as the company does not participates in any researches and gives only general information about the company, human resources employee said. Today company is one of the expanding retail chains in Lithuania. It has 113 stores and takes the third place in the country's retail market. See figure 18 that shows the number of stores companies in retail market has and figure 19 that shows yearly turnover of the companies that is important when talking about investments to technologies, people competence development and systems.

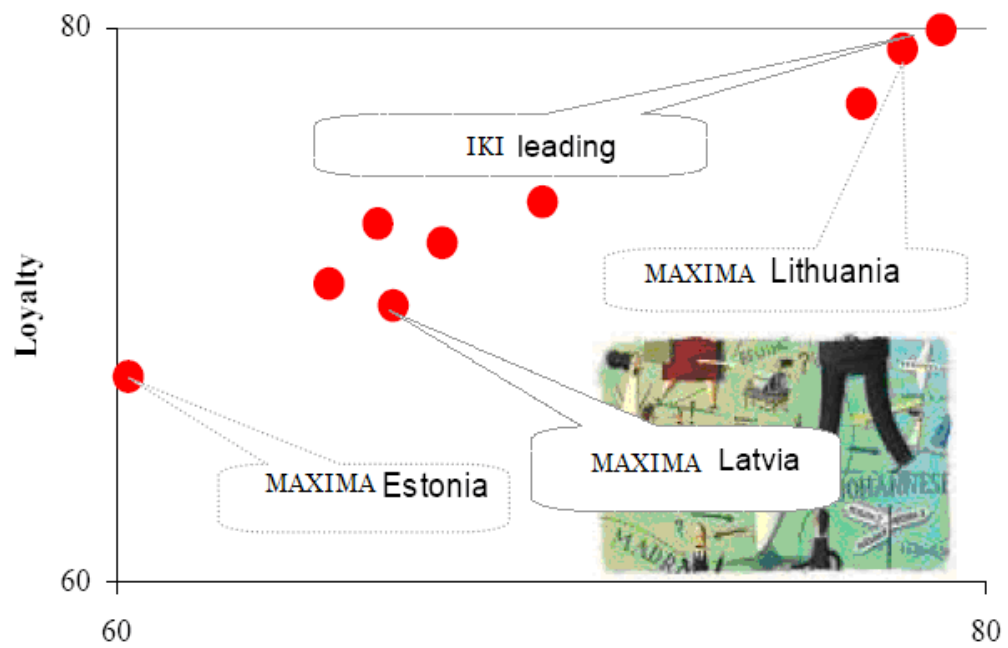


Figure 17. Loyalty vs EPSI, Baltic Supermarkets, 2007 [42]

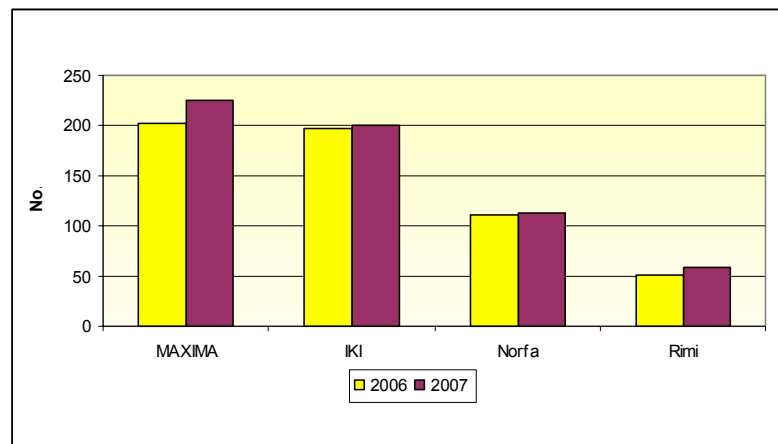


Figure 18. Number of Stores

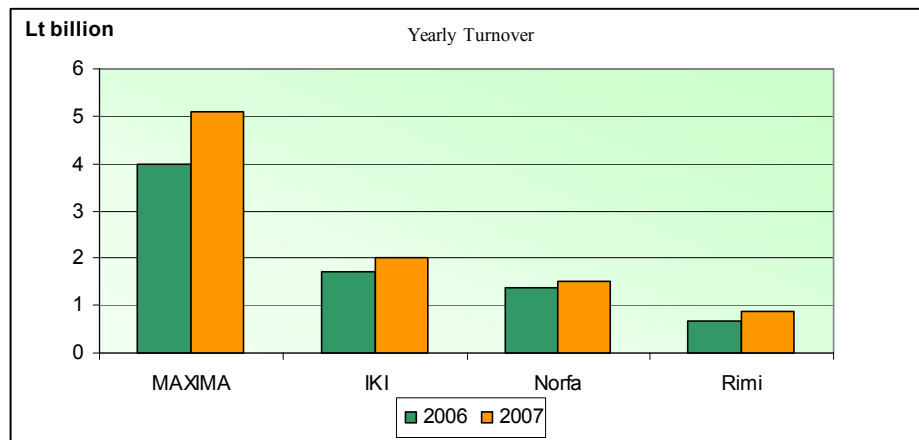


Figure 19. Yearly Turnover

The turnover in 2007 was 1.5 billion litas and it was 10% more than in 2006 (1.37 billion). There was a great increase in the private label goods turnover. All of the retail market players except IKI has their private labels and tries to promote the goods and gain customer loyalty as much as possible. Company has almost 130 employees in its office, more than 70% has higher degree and around 10% of administration employees are students, respondent said, and more than 4400 employees works in its stores. Training costs and days per employee per year were not disclosed only mentioned that trainings according each manager's needs are provided.

The strongest relations Norfa has with its suppliers. The strategy of the company is to have centralized supply therefore it has only 1 main supplier that sells around 75% of its entire turnover to Norfa. Here company bears a great risk if something happens and relations with the supplier changes it might affect its activities a lot. Also company losses in gaining more process and customer knowledge that different suppliers can bring as well as differentiated experience. However company enjoys a great relationship that none of the competitors have. As the human, structural and relational capital encompasses the intellectual capital it might be concluded that company put most of its efforts to relational capital and its development concentrating on supplier relationships.

Neither of the companies above agreed to give information needed to test the intellectual capital management model in retail company as it is confidential and researches are not made inside the companies. As it was mentioned the intellectual capital management, indicators creation, internal and external environment and financial figures analysis requires a lot time and efforts, also disclosing the information that company usually do not tell to its internal and external stakeholders. The model itself does not give any great benefit if not analyzed, only first ideas of hidden assets in the company and their activities that are unseen but however have impact on company's results. Having such a strong competition today companies are afraid of their strengths and weaknesses disclosure to its competitors, while the results of the analysis how to manage intellectual capital in the company might lead to competitive advantage. The lack of awareness of the topic also did not help to convince the companies to participate in the research, however one of the retail market player agreed.

Quantitative research. The model has been tested in the international retail company that operates in three Baltic countries with one name. The mother company is based in Sweden and has a retail business in more than 7 countries around the world. As Swedish companies are the pioneers in the field of intellectual capital therefore to gather the data needed for the master thesis was a bit easier. Not as much rejection, distrust and questions where met. As you'll see the model testing in the company required a lot of disclosure of information that not every company wants to show for the

society, therefore not many companies want to put an effort to start managing the intellectual capital. Intellectual capital model has been tested in three companies belonging to the same chain; let's call it LT, LV and EE companies. The Baltic chain started its operation three years ago as a plan to expand into Baltic region was implemented and today runs 216 stores and employs over 8000 people. The organizational structure is a bit different in every company but all of them are reporting to Baltic level management based in Riga.

The mission of the companies is to be the customer's best choice for products by offering value for money and services with care in locally adapted stores. Company strives to increase effectiveness and to lead in competition war. The every day work of the companies is based on four main values, coming from Nordic shareholders, which create a great ground for company's decisions:

- To make every day a little easier for a customer
- To increase company's value in order to open the door for new opportunities
- The company's success secret – its employees
- To maintain strong feeling of CSR (corporate social responsibility)

And intellectual capital management can be a great tool to ease every day work and achieve mission of the companies.

Further I test the model separately in every company and make a comparison of the results. Systematic had a structure for intellectual capital statement, the model tested here takes a broader view and broader analysis for retail companies will be made.

ENVIRONMENT. The Baltic market for retail industry grew by 12 percent in 2007, to approximately EUR 6.7 billion. Very high competition among the market players is expected to increase even more. The retail chain analyzed is the second player in the region.

JSC LT works in very competitive environment and is the fourth player in Lithuanian retail market. To obtain and sustain competitive advantage is very difficult. Company mainly operates in biggest cities in Lithuania and already has 58 stores. Lithuania is the largest market, followed by Latvia and Estonia. In Lithuania, LT opened 6 new stores increased its sales by 27.6 percent in 2007 and is the fourth largest company, with a market share of approximately 9.3 percent. While the main competitor has 46.9 percent market share. The Lithuanian retail industry is 26 according to attractiveness for investors in the world top 30. Hence the market is filled and the economical and political situation of the country results in such valuation.

JSC LV sales increased by 26.9 percent and its market share was approximately 23 percent in 2007. The environment is very favorable for retail business to develop in Latvia. Company already has 94 stores in Latvia, is the second player in the market and widest spread between Baltics. This is mainly because of very attractive situation in retail sector in Latvia that experienced the strongest annual growth in EU and is very attractive for investors. The industry should grow in all countries because of increasing consumption, higher wages and credit systems.

JSC EE had faced very high competition during 2007 and its sales rose only by 5.3 percent, but its market share decreased slightly to 22.4 percent from 24 percent. Total country's retail industry decreased significantly in 2007, mainly because of peoples distrust in the economy and growing interest rates therefore the company also was not able to sustain its competitiveness. In Estonia company takes the leading position in retail market and owns 65 stores.

Following the model further main financial data of the companies are given, objectives and knowledge that will lead to indicators system.

FINANCIAL FIGURES

Turnover of the companies: 2007/2006

LT	LV	EE
248 m EUR / 194 m EUR	544,5 m EUR / 429,3 m EUR	363,9 m EUR / 345,6 m EUR

Expenses of the companies: 2007/2006

LT	LV	EE
69 m EUR / 51 m EUR	347,6m EUR / 212,8 m EUR	189,2 m EUR / 156,8m EUR

The target group of employees for the intellectual capital model is office employees in every country (excluding stores personnel), year 2007/2006

LT	LV	EE
216 / 226	227 / 232	175 / 171

Market share that has all countries together in Baltics is 17.3%

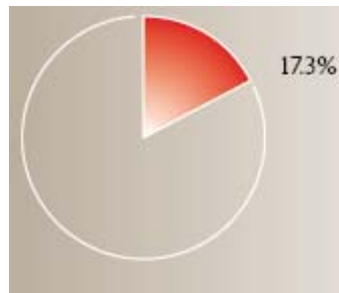


Figure 20. Market share

Sales of all Baltic group in comparison with previous years:

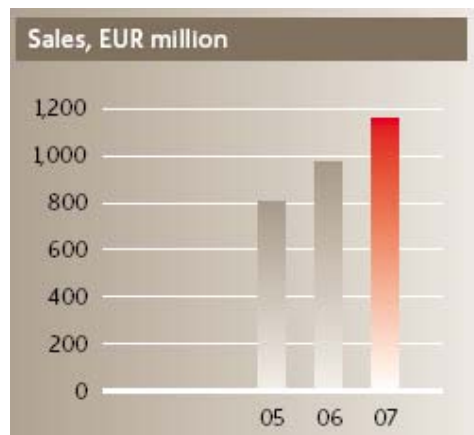


Figure 21. Sales of Baltic group

VISION, OBJECTIVES AND KNOWLEDGE. These are the inputs or resources that developed and understood correctly leads to activities and processes in the organization. The vision of the companies is to become a leader in retail market, win the war of competitors in retail industry and serve its customer with the highest quality products. To increase efficiency of the stores by creating a perfectly operating centralized warehouse system, share the knowledge through all the countries. It is important for the companies to improve opportunities for synergies in administration, IT (invest time and money for improvement) and purchasing (continuous supplier relationship development). This adds more and more value to customers and employees as well as companies' development. Increase awareness of private label of the company and train people how it should brought into the stores together with other products. The objective is also to put more efforts in stores upgrading, improvement (systems, networks, human capital) and quality. The relation with parent company, intensified cooperation and knowledge sharing has major importance. One more management challenge is to shorten decision making process, regarding business processes and policies of the companies. Employees are the

“engine” in the value-creation process. Therefore a focus on employees’ satisfaction and motivation leads to greater company results and the development of business. Retention of employees is a challenge for Estonian company; however LT and LV should also put more effort on this issue.

As the companies operates only three years in the Baltic’s it has to gain customers trust to be their first choice and to be successful in the future. Supplier relationship also plays a major role here when formatting the assortment and sharing the experience. Intangible assets such as employee know-how, customer and supplier loyalty, and efficient processes are the most important for its future competitive advantage and development. As intellectual capital management is not widely applied in Lithuanian companies, some intellectual capital statements are emerging but still are not included in the yearly reports and have not sound impact for companies’ results.

In preparing intellectual capital model the aim is to depict the knowledge resources and to try to show to the management that it can help to evaluate the efforts made to develop these resources, to ease management decisions and create value. Hereafter measurement system has been created for intellectual capital measuring. Indicators were calculated relying on the questionnaire answer [appendix 1] and information gotten from the companies’ internal sites.

SYSTEM OF INDICATORS / MEASUREMENT. According to the data of the companies indicators are calculated and presented in the tables below, showing what company is doing with its intangibles and allows to see how the objectives are being fulfilled. The structure was chosen the same as Systematic used in terms of resources, activities and effects. The sequence here is that more invested, expanded and put in resources leads to enhancing the value via different activities and the results is seen in the effects row. The first **human capital** measurement indicators are analyzed.

The Baltic countries have adopted human resources policy developed in parent Nordic company following the strategy is to compete with best products and service therefore HR department seeks to attract courteous employees. The department in the companies strengthens trainings, competencies of employees, creates environment for growth and development, as well it strives for competitive work payment. The main strategy in the HR area is to strengthen the companie “X” brand and its position as an employer. Four areas are priorities: diversity, competence, wellness and leadership. In each area, company has established objectives and activities (figure 22).



Figure 22. Strategies for Human Resource Work [36]

Strong leadership is stressed to handle new challenges in a changing industry. A structured approach to gender equality and diversity issues is considered in the companies. Group's success is dependent on having employees with different educations, ages, genders and national backgrounds, also people with disabilities. One of challenges is to utilize gender equality and diversity work to capitalize on differences and thereby improve its financial results and attractiveness as an employer. Ensuring that competence is in place in strategic areas to facilitate long-term planning is also very important as well as positioning company as a health-conscious employer. Occupational health and safety policy states that work environments are an important competitive advantage and a strategic issue.

Ability to produce right product and service is dependent on the knowledge and commitment of employees. Therefore companies are trying to provide challenging workplace and ability to learn. The highest investments per employee per year are made in LT company – 3343 Lt (see table 5), and these investment indicate that the company is more willing to invest in retaining its employees. An increase in number of employees trained as project managers increased the training expenses as well as satisfaction of employees. LT company not only invests in people training internally and externally but also offers scholarship policy for studying employees. This leads to increased work satisfaction and loyalty, also this way company is growing young people to become strong specialists. See the figures 23, 24 and 25 that present the relation of training costs, number of trained employees and satisfaction. Training investment is lower in LV and EE companies mainly because of slower development of training departments' projects. So the management should face a challenge to develop the competencies of its staff. And great program is developed by the parent Nordic company that all employees of who have been with the company more than one year have the opportunity to apply for a

training grant. Grants are awarded by management team based on an assessment of each employee's performance and training needs.

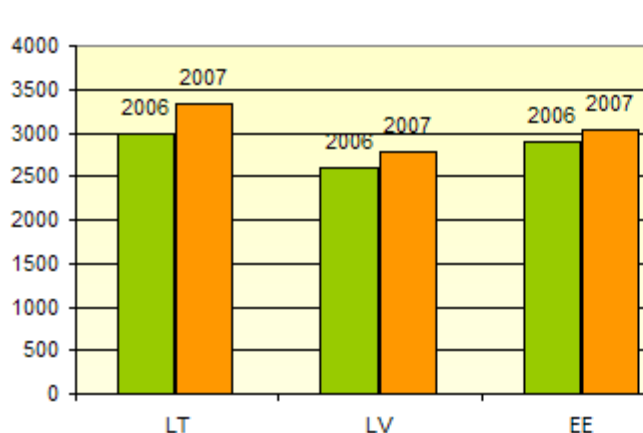


Figure 23. Training Costs per Employee

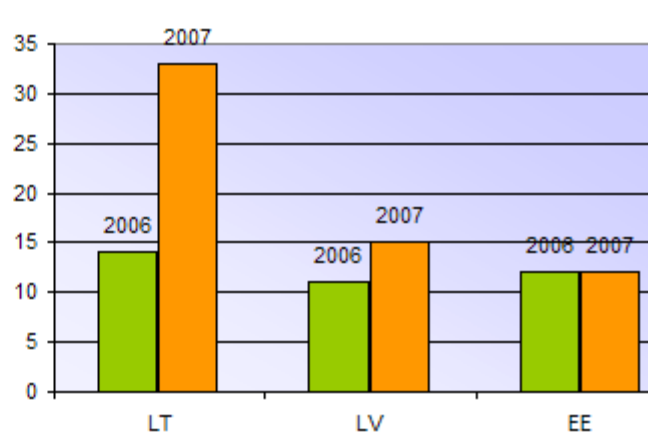


Figure 24. Employees Trained as Project Managers

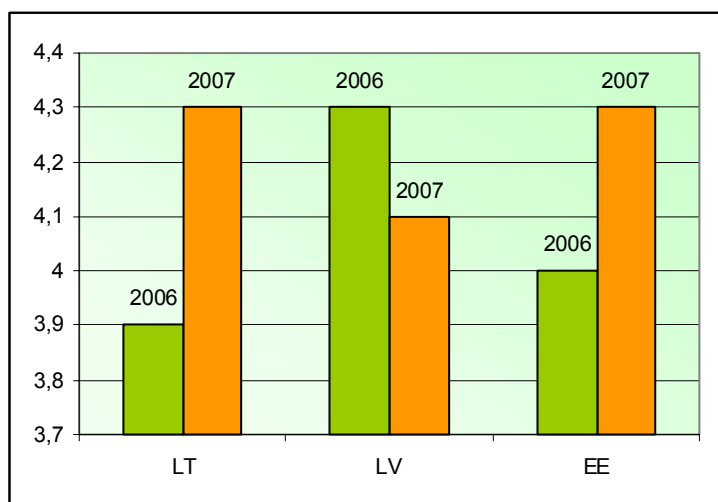


Figure 25. Employee Job Satisfaction

According to the numbers in LT and LV number of employees (see table 5) decline during the year and the reasons are different. Quite high numbers show companies size and ability to expand with lower human resources. The responsibilities of people who left were divided to others, noticing the stronger potential. EE company expanded during the year and bared very high competition therefore management team was strengthened by few more people in 2007. Organizational structures are quite clear in the companies, the competencies are determined and the change recorded every year. This system makes it clear where people should make point of doing something and work as a motivator. The yearly bonuses of management depend on their work and development of their competencies.

Table 5. Human Capital Indicators in LT, LV and EE

	<i>HUMAN CAPITAL</i>	LT 2006/2007	LV 2006/2007	EE 2006/2007
Resources	Number of employees	222 / 216	232 / 227	171 / 175
	% men	39 / 36	41 / 44	33 / 37
	% women	61 / 64	59 / 56	67 / 63
	Average age	30 / 31	39 / 36	37 / 40
	Managers average age	38	40	39
	Highly trained people %	80	87	91
	% students	16 / 15	11 / 13	11 / 8
	% excellent English skills	86 / 89	89 / 91	75 / 78
	Average seniority years*	- / 1.8	- / 1.6	- / 1.5
	Employees trained as project managers	14 / 33	11 / 15	12 / 12
	Employees having foreign retail work experience %	5 / 4	9 / 11	4 / 5
	Employees having experience in international projects %	35 / 56	47 / 64	37 / 59
	IT employees	6 / 6**	4 / 3	5 / 2 ***
Improvement activities	Training days per employee	7.1 / 9.34	5.8 / 6.4	4.3 / 5.7
	Training costs per employee Lt	2987 / 3343	2596 / 2781	2892 / 3034
	Experience exchange meetings /y	4 / 6	4 / 4	4 / 7
	Job promotion	18 / 23	21 / 24	11 / 16
	Job rotation %	1.8 / 2.8	0.86 / 3	0.6 / 2.3
	% of the projects that are based on inter-departmental cooperation	9 / 14	11 / 13	8 / 10
	Competency and career planning	100 %****	100 % ****	100 % ****
Effects	Employee satisfaction (scale 1 to 5 being the highest)	3.9 / 4.31	4.42 / 4.1	4.12/ 4.37
	Staff turnover %	6 / 9.7	6.9 / 12.3	7.6 / 16.6
	New staff	13 / 21	16 / 28	13 / 29
	Sick leave* %	1.7 / 3.1	2.1 / 2.5	2.4 / 3

* indicators tracked by HR system

** 2 IT employees are working at Baltic level

*** after employees left the company it decided to outsource

**** career planning is developed for every employee when making yearly performance appraisal, the same system works in all 3 countries

The team in the LT company is young, while EE is eldest should consider of a mix of younger and more experienced employees for more new ideas. According to the table LV company's employees

has the most experience in international projects as well as foreign retail knowledge, this is mainly because Baltic level management team is based in Riga and knowledge sharing to other countries comes from LV specialists, this adds value to trusting knowledge and experience of its employees. The knowledge also might be explained by job promotion and rotation indicators that indicate of staff flexibility and mobility, development of employee competencies through new challenges, retention and dissemination of knowledge. LV team is leading again, and EE company has lowest indicators, however it is the smallest company among three (see table 5).

Project teams and participation in projects is also of the major importance because of the knowledge and experience sharing. Together with experience sharing meeting the projects add value to this process. During the three years of work in the Baltics the management of each company should think of the way to diminish the staff turnover and increase employees' satisfaction, remembering that only satisfaction leads to loyalty. The highest turnover of employees in EE company (see table 5) again reminds of its competition situation and proves that company is very sensitive to pressure and change. The great for employees of the companies is the ability to have career plans, so to be more motivated to reach more for organization and its members. The goal of this system is to encourage internal mobility, so that 70 percent of available positions are filled by in-house candidates. A lot of experience and information is gained from Nordic parent company and this relation could help manage intellectual capital more effectively.

To summarize:

<i>HUMAN CAPITAL</i>	
Company LT	• No. of employees decreased by 6 • High investment in trainings (3343 Lt per person/per year) resulted in highest no. of employees trained as project managers – 33 • Good indicator of staff promotion – 23 people and job rotation – 2.8% results in competency development, dissemination of knowledge and lowest staff turnover 9.7% • High employee job satisfaction – 4.31% influenced by many training – 9.34 days per year, young team – 31 average age, experience sharing meetings – 6 per year, best IT work practice – 6 IT employees
Challenges	Increased human capital through higher job satisfaction and loyalty results in lower turnover and lower sick leave.
Company LV	• No. of employees decreased by 5 • Lowest investment in trainings (2781 Lt per person/per year), no. of employees trained as project managers – 15 • Best indicator of staff promotion – 24 people and job rotation – 3% one of the factors that increased experience in international projects – 64% • Lowest employee job satisfaction – 4.1% influenced by high staff turnover – 12.3%, lower training investments – 6.4 days per year and poor IT service – 3

	IT employees
Challenge	Increased human capital through higher investment into competency development would result in lower knowledge leak, higher job satisfaction and increased experience dissemination.
Company EE	• No. of employees increased by 4 • Higher investment in trainings (3034 Lt per person/per year), no. of employees trained as project managers – 12 • Lowest indicator of staff promotion – 16 people and job rotation – 2.3% also had an impact to highest staff turnover – 16.6 % • Highest employee job satisfaction – 4.37% influenced by higher training investments – 5.7, highest no. of experience sharing meetings – 7 per year and increasing international project experience – 59%
Challenge	Increased human capital through greater management of people flexibility, mobility and competence development through new challenges, resulting to more project managers in a team, decreased staff turnover, IT employees' recruitment vital for processes and systems to work competently.

According to the model the second pillar of intellectual capital (human, structural, relational) is **structural capital** that certain the effectiveness of the processes; quality of the services and products and together with human capital builds the third IC pillar. Table 6 shows the indicators calculated for structural capital in companies LT, LV and EE. As the resource data in the table indicates information sharing in the companies works great through the systems created. Intranet is updated with all the needed information for employees' everyday work so saving time and efforts. LV company was the first one that started the Intranet usage therefore the indicators are the highest, however when the system is useful and easy to use it is spread very fast. Organization spends a lot for the development in the company, systems creation and purchase of new programs, also PC is available for almost every employee what shows that companies keep up to date with technological developments and gives opportunity for information flow. IT mistakes can cost a lot therefore investment are made to avoid them. However employee satisfaction with IT equipment decreased significantly in EE also LV companies and this might be tied with decreased number of IT employees in two companies. The expertise and knowledge has decreased and outsourcing does not satisfy employees' needs. Figure 26 shows how decreased number of IT employees impacted the satisfaction with IT equipment in LV and EE companies. Management should solve the issue relying on the experience of LT country that has a possibility to share the potential and experience of IT employees at Baltic level together meeting internal needs. The higher level management of the companies has laptops and so the possibility to work at home or during the trips, again adding the efficiency to the whole process.

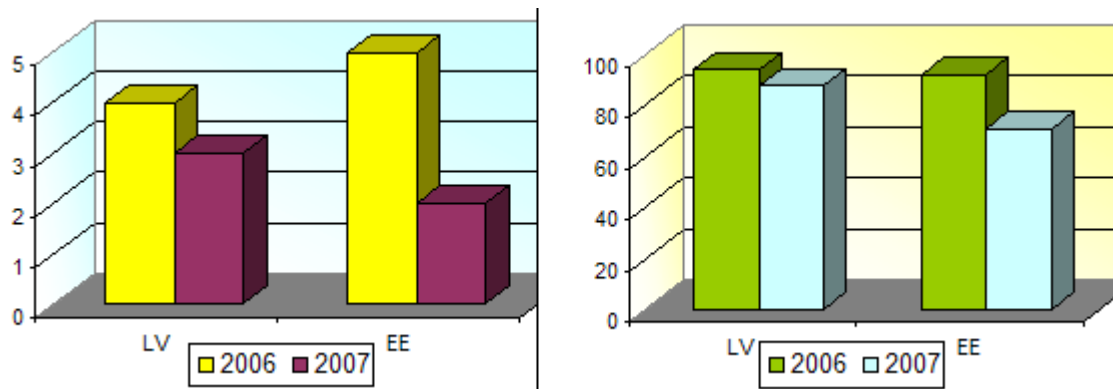


Figure 26. Decreased Number of IT Employees vs Satisfaction with IT Equipment

Table 6. Structural Capital Indicators in LT, LV and EE

	<i>STRUCTURAL CAPITAL</i>	LT 2006/2007	LV 2006/2007	EE 2006/2007
Resources	Internal information and knowledge sharing %	89 / 97	92 / 99	89 / 95
	% of managers in the company	31 / 30	44 / 42	28 / 31
	R&D costs (thousands LT)	150 / 280	230 / 380	120 / 250
	Number of patents	0 / 1	0 / 1	0 / 1
	Intranet activity and usage %	100	100	100
	PCs per number of employees	0.9 / 0.87	0.9 / 0.93	0.86 / 0.88
	IT costs (thousands LT)	520 / 350	650 / 400	480 / 310
Improvement activities	Upgrades of the Database	4 / 6	4 / 6	4 / 6
	Projects no.	3 / 6	4 / 6	3 / 5
	Average project team size	7 / 7	9 / 10	4 / 5
	Projects lasting longer than 6 months	1 / 3	2 / 3	1 / 2
	% of Employees that have possibility to work at home	28 / 33.4	41.7 / 49.2	25.2 / 30
Effects	Quality certificates	18 / 27	24 / 31	15 / 24
	Employee satisfaction with work place %	86 / 81	92 / 94	90 / 93
	Employee satisfaction with IT equipment %	96	94 / 88	92 / 71

Quality work in the companies is to ensure product safety throughout the supply chain, from primary producer to consumer. Companies invest a lot to R&D in quality field as well as certificates gaining to assure the customer with the best quality and process improvements. Last year companies

invested a lot into creation, presentation and development of the private label product. Today it is also one of the main challenges that management should achieve.

Employees' satisfaction with their work place does not reach 100%, the lowest it is in LT company (see table 6) as the survey showed employees mainly were complaining about bad conditioning system, this might result in lower total satisfaction, higher turnover and sick leaves. The management should make a decision and frequently talk to the employees how do they feel. Project number and duration is increasing during the year encouraging new ideas, knowledge creation and development of the processes. One more important issue relieving work of suppliers is establishment of the centralized logistics center in LV company. This is creation of complex distribution network ensuring the highest quality products to the customers. Also central plant system in EE company was created to make stores operations more efficient. The experience gained will be used to start similar projects in LT and LV companies. The attention put on the value that is created by internal systems, structures and culture shows the companies are looking to the future. To summarize:

<i>STRUCTURAL CAPITAL</i>	
Company LT	• Decreased satisfaction with work place – 81%, might be a input to increasing sick leaves per year – 3.1 days • Highest satisfaction with IT equipment– 96% resulting from human capital input • Good work of systems for information sharing – 97% that ease everyday work of employees as well as high PC per employee indicator – 0.87 • Lower indicator of people having ability to work at home – 33.4%
Challenges	Increased structural capital through resolving work place dissatisfaction problems, development of warehouse management, HR and SAP systems
Company LV	• Best information sharing processes – 90% resulting into lower investment to newcomers introduction • Increased satisfaction with work place – 94%, and highest indicator of people having ability to work at home – 49.2 % might be a result of highest IT costs • Lower satisfaction with IT equipment – 88% resulting from decreased no. of IT employees and poor quality of IT service
Challenges	Increased structural capital through IT recruitment investment, enhancing databases, HR systems, central sourcing processes
Company EE	• Information sharing increased during the year by 6% to 95% indicates easier everyday tasks solving and higher job satisfaction • Lowest satisfaction with IT equipment – 71% resulting from decision to outsource IT services • Low project number and project team size – 5 each indicates of lower ability to handle new projects
Challenges	Increased structural capital through IT recruitment investment or strengthen outsourcing, stronger project team to handle big projects, higher investment to quality certificates to have more satisfied customers and logistics processes development to reach greater efficiency and avoid ordering mistakes.

The third pillar of the intellectual capital according to the model (human, structural, relational capitals) is **relational capital**. Employees contribute to their work by providing knowledge that can fill the gap between the customer/end-users and systems creators. The most important is to realize how much one can get from the customers and that to gain new customer is much harder than to retain existing one. Unfortunately, none of the companies has made a survey of their customers yet, though marketing department in LV is putting a lot of effort for that and results are already seen. European Performance Satisfaction Initiative (EPSI) [42] rating studies customer satisfaction within the industry in Baltic countries. The study shows that Lithuania leading with satisfaction growth rate and Index having Estonian “negative trend” as a background and Latvia standing in a mid. In 2007 Lithuania demonstrated a rapid growth in EPSI. However according to the survey highest customer satisfaction is in company LV, followed by EE company. LT should put more efforts to retain the growth it maid in 2007 and win customers from its competitors. Because satisfaction drives to loyalty and there is a strong positive relationship between loyalty and profitability (see figure 27).

Other important indicators in relational capital are supplier associated indicators. Here knowledge can be leveraged in different ways to create value. Suppliers can develop the intellectual capital with product knowledge that bring to buyer, process and customer knowledge (table 7).

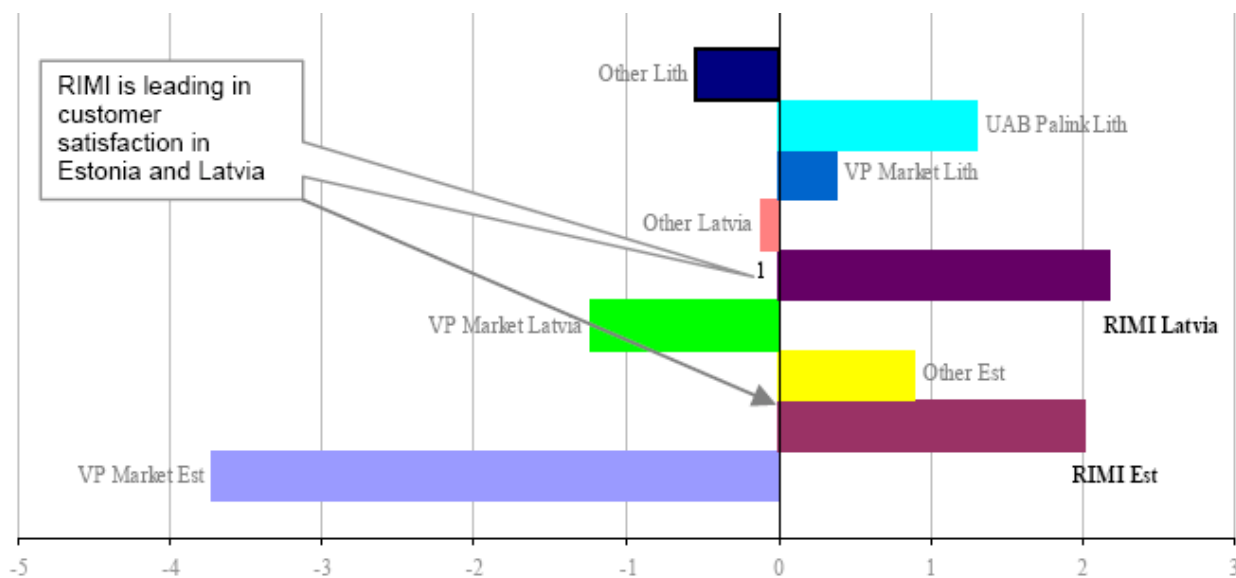


Figure 27. Rimi in Baltic Countries [42]

Table 7. Relational Capital Indicators in LT, LV and EE

	<i>RELATIONAL CAPITAL</i>	LT 2006/2007	LV 2006/2007	EE 2006/2007
Resources	Turnover in terms product group (fresh)	- / 38%	41% / 43%	- / 29%
	Company name and image	NA	NA	NA
	Internal newspaper no.	1	1	1
	12 main suppliers goods part in total turnover %	38 / 42	49 / 54	39 / 37
	Countries where company operates	3	3	3
	Partners for opening new stores	2 / 3	3 / 3	1 / 2
Improvement activities	Communication with universities and schools	3 / 6	2 / 4	2 / 4
	Articles in press	1132 / 1268	2098 / 2251	1065 / 1198
	CV's no. per year	- / 3241	- / 2893	- / 2745
Effects	Customer satisfaction *	- / 77.2	- / 69.8	- / 66.1
	The average number of working years with suppliers	1.2 / 2.1	1.4 / 2.3	1.5 / 2.4
	New suppliers number per year	9 / 6	14 / 9	11 / 8
	Employees participated in conferences %	- / 10	- / 23	- / 9

* index taken from EPSI press release [42]

According to indicators calculated (see table 7) is seen that LV company is taking most value from supplier relationship, by having agreements with its 5 biggest suppliers and getting knowledge of lower-cost process technology, products knowledge from understanding manufacturing process and greater customer knowledge with innovative problem solving, differentiation and understanding what customer need. The better this relationship the closer contacts, better possibility to keep competitors away. The companies also have meeting schedules with its suppliers to create closer relations. Turnover in terms of product group is and indicators that can help company to value its risk, how much it is dependent on it and better prepare for possible changes.

LT company is the leading in communication with universities and schools (see table 7), reflecting great external relationship and employer branding efforts. Trainee program is developed in all companies that encourage finding best studies who are eager to learn in successful international

company. However, LV and EE companies still do not find an efficient way to communicate with universities and schools. CV's number per year indicators shows name of the company is known in the environment, as well as the image of the company (see table 7). Company name is quite distinctive, easy to say and from year 2007 compatible with the product name. This should lead to higher interest of customers, investors and suppliers. The articles in press indicators and employees participating in conferences shows how communication to the environment works in the companies, how companies are following business news and presents itself to the society. Companies according to positive, neutral and negative reference number and audience reached research show how many times every company was represented positively, neutral and negatively to its stakeholders (see figures 28 and 29).

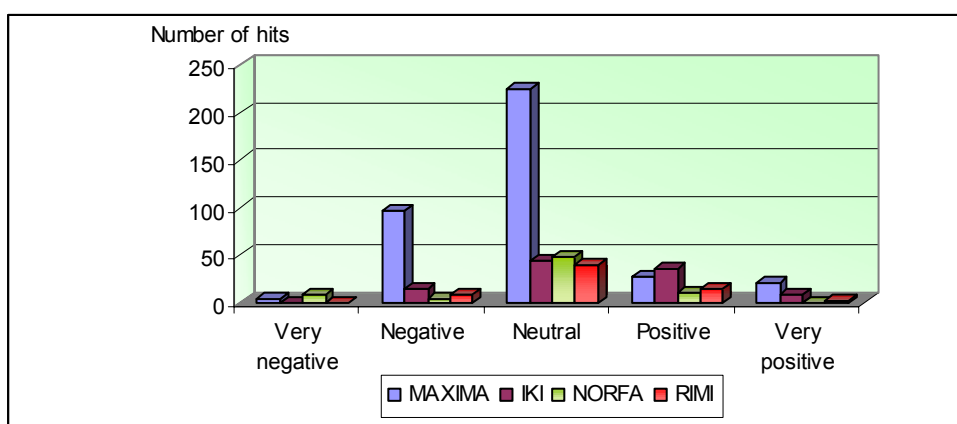


Figure 28. Companies According Different Reference Number [40]

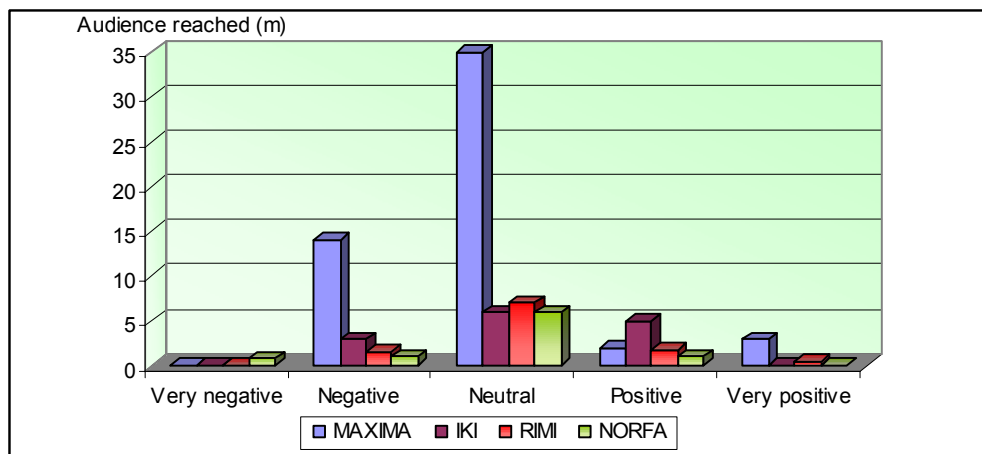


Figure 29. Companies According Audience reached [40]

The relationship companies build adds value. It can be thought of as the strategic advantage afforded by key relational ties. Therefore it is important to diminish the number of negative mentions

not to create bad expression in potential investors, partners, customers and employees minds. Relations with partners are also important for the ease of the processes and sharing the information. As LV company has the highest number of the stores it has developed this relationship most. Time is what helps to create value from it. Internal newspaper encourages the communication within the organization and motivates people to feel important for the organization, it help to form organizational culture.

Intellectual capital indicators can form the basis for future development of the companies through improved knowledge management that makes knowledge sharing more efficient and promotes knowledge development. Furthermore, satisfaction indicators, good or bad, will force to take action to improve unsatisfactory results. Sharing the intellectual capital indicator results between customers, partners, employees and competitors might contribute to creating new contacts to future job candidates and to organizations and enterprises as potential customers.

To summarize:

<i>RELATIONAL CAPITAL</i>	
Company LT	• Higher main suppliers part in company's total turnover – 42%, might be a note to increased risk • Highest customer satisfaction – 77.2 indicates better service and greater customer knowledge resulting into loyalty • Great communication with universities – 6 universities results in brand name knowledge and better external relationships • Lowest indicator of average years working with suppliers – 2.1
Challenges	Increased structural relational capital through customer research to reach higher loyalty, better supplier relations to increase product, processes and customer knowledge, continue articles in press release to increase brand name knowledge.
Company LV	• Highest main suppliers part in company's total turnover – 54%, might be a note to increased risk together with better supplier relations • Highest number of partners – 3 resulting in better market knowledge • Higher indicator of average working years with suppliers – 2.3 indicates increase in product, customer and processes knowledge
Challenges	Increased relational capital through watching the main suppliers' part in company's total turnover, more efforts to increase external relationship with universities that might lead to higher CV's no. per year, customer preferences research.
Company EE	• Lowest no. in CV's per year – 2745 and external communication with universities and partners • Highest indicator of average working years with suppliers – 2.4 indicates increase in product, customer and processes knowledge. • Indicator of customer satisfaction – 66.1
Challenges	Increased relational capital through increased brand name knowledge, customers research, partners for market knowledge

ACTION. Here it is important to identify knowledge resources that have impact on efficient and competitive operation and need to be shared (constant communication) and developed (trainings). The values of indicators and the changes in it can give clue to management what works and what doesn't. This way it is easy to make decisions.

According to the indicators the highest employees' satisfaction is in LT company while LV has the worst results. This might be associated with an investment to management development; LV has the lowest training investment and the lowest increase in training days per employee. Therefore this might lead to decreased job satisfaction and therefore higher staff turnover also seen in the indicators (tables 5, 6, 7). Turnover ratio increased a lot in the company LV even though EE ratio is higher, LV number of employees decreased during a year and in EE increased, this should be taken into account. The staff turnover ration has increased in all companies therefore management has an issue to solve what is making people to choose other employers and act accordingly.

As the number of employees decreased in 2007 and still companies succeed to achieve higher results with lower human resources, maybe a challenge here is for management to think through resource allocation in the company. Higher investment into processes or supplier relations could lead to more value. Important to notice a relationship between decreased number of IT employees in LV and EE companies and decreased employees' satisfaction with work equipment. Even though the IT costs are high in all three companies especially LV people are not happy. Hence the management decision to outsource IT function leads to undesirable results, as the outsourcing company people are not aware of the policies, systems and culture.

Information sharing works in all organizations. Intranet was a great decision to ease every day work of people and is used almost 100%, documents are updated and placed. However other issue might be the websites, especially EE company's website that lack English translation function and more information about the whole chain and its activities starting campaigns, loyalty programs, job offers, etc. As today's customer uses all possible technologies to shorten its time in a store this might lead to switching to competitors with the time.

Projects is where the knowledge creation process works best because of intense sharing and new ideas, project numbers increased in all organizations according to the indicators and the results of the projects are good also having an impact on yearly companies success the ongoing projects and more projects with parent company should be considered by the management. Decreasing employees' satisfaction with their work place in LT company requires management attention too, as this indicator might influence sick leaves and lower satisfaction that in time results in poor loyalty.

As the total number of suppliers in each company is around 500, the KPI's (key performance indicators) system is created and is made according 12 largest suppliers. System is communicated to the suppliers and helps to form more partnership agreements. As the LV company works best with its largest suppliers gains most from the three sources of relational capital it can bring process, customer and product knowledge. The management of the LT and EE companies should work a lit more on developing these relations to take the most from suppliers to create value in the company. Customer satisfaction index is a great indicator for management to rise the question what they can do better to have more satisfied customers. LT company has to do a lot work here according to the research, as the leading competitor does not have a lot more market share in the company. Customer knowledge here gained from suppliers might be a starting point and more effort to customer analysis, to get the knowledge what customer wants and increase the loyalty that leads to profitability.

The indicators in table 7 (articles in press in LT increased by 136, in LV by 153 and EE by 133 during a year) shows that all companies released more press articles during the year, the more CV's were gotten so the image, brand and knowledge of the company in the market increases with giving management more potential employees, suppliers and partners.

REPORTING AND DEVELOPMENT. This is the part were companies has to decide whether to publish their intellectual capital report say together with annual report or CSR report or separate as a supplement to financial figures presented to the stakeholders. The intellectual capital reports and the intellectual capital are concerned with the value creation of companies. They are both a statement of a company's value at a given time and form part of a bigger picture where they are used to identify the sources of the company's growth. It is important to work as feedback information to the new intellectual capital development.

VALUE CREATION. Intellectual capital is important because balance, perspective and unity are necessary elements as regards the company's chances to support the value creation of tomorrow. The aim is to be able to manage the company's direction towards the future and make the relations and assets creating growth visible. Therefore if the management of all companies will pay attention to the challenges mentioned in earlier parts of the model and further follow the change in its hidden assets the greater value and financial results might be noticed and the reasons for them to appear clear.

To summarize, model was not applicable for the first three retail market players as there was not enough information needed for all parts of the model. Hence, great disclosure is required in order to fully apply developed IC management model to the companies and this is might be stated as a drawback distinguished in the model testing. However model was easy and simple to test in the LT, LV and EE companies as it is flexible and provided as step-by-step procedure and there was ability to get

all information required. Almost all indicators were used proposed in the model and there were no need for additional ones. The broadness of the model allowed analyzing the environment of the companies quite particularly and revealed the uncertainty if it is possible to manage the intellectual capital in retail industry's companies. The knowledge navigation works in all of the companies the testing of the model showed, because the ideas cultivation is highly promoted, vision is communicated and employees especially project managers in LT company start new projects with the openness and analysis of the options available, that is the knowledge navigation. Through answers to questionnaires was easy to calculate indicators and develop a system of measurement. People of the companies invested their time and answered the questions quite fast, except the research in EE company where fewer respondents were and it took more time. All the companies focus on their human capital, despite decreased number of employees in two of them efficiency has increased. So management took a good decision, by decreasing number of employees and saving up some costs. Investment in employee training is vital for the future of any organization therefore training cost and training days per employee increases every year. The main benefits gained from the training are: increased job satisfaction, motivation, innovations, and increased efficiencies in processes. These result in financial gain, increased capacity to adopt new technologies, and methods faster. According to the questionnaire results employee job satisfaction increased during the year, few respondents mentioned more interesting assignments and better work environment. Increased number of employees trained as project manager indicates greater company's ability to handle project work. As the number of project increased a lot in LT company and because of their business view most investment were made in project management training. Experience is shared a lot in all companies that cultivates the new ideas and increase process efficiency. Higher investment into researches and investment to IT, as well as databases, equipment and other systems indicates that company follows the change in technologies world. Relational capital is the one were companies should try to develop, especially LT in customer satisfaction and loyalty, EE in working with partners and all in having better relations with suppliers to take the knowledge of the customer, processes and systems. The model tested revealed some challenges for the management of the companies: to shorten decision making process regarding business processes and policies of the companies to assure constant work, retention of employees is a challenge for Estonian company in order to avoid leak of knowledge, competencies development of the employees required in LV and EE, decreasing employees satisfaction with their work place in LT company requires management attention, etc. As the practical aim of managing intellectual is to provide management with a tool for monitoring and disclosing information about their activities and efforts to manage the company's knowledge base the testing of the model gave these guidelines for the management of the companies

where the model was tested. Companies are eager to increase their human capital by with the management development; online questionnaire is being developed to finding our more about their employees' satisfactions and dissatisfactions, to increase their processes with the creation of the new HR system, SAP system, to strengthen relations with customers developing new campaigns and agreements with the suppliers. The intellectual capital management model can work in the companies where it has been tested, company donated time and efforts to develop the indicators, now the greater management analysis is required, development of IC, structuring of the results and start thinking of reporting to its internal and external customers.

3.3. Generalization of IC Management Model Testing and Further Directions

The model presented gives a structured picture how to accomplish information disclosure for stakeholders and easier management decision making. However, since the field of intellectual capital is still in its development stage, no one is willing to give up their own "view" and build on each other's work many models are being developed. Model proposed in has some distinctions in the pool of others. The greatest advantage of it is that is gives a thorough, comprehensive and consistent view how to manage the intellectual capital. It is not based on specific industry or company and provides step-by-step procedure from intellectual analysis, ideas and goals, through system of measurement that further leads to result solving intellectual capital management problem in a company. Model is broader than presented by others and avoids superficiality. That makes it similar to direct intellectual capital and scorecard methods, but also excluding it because of versatility and more coherent parts. As it is important for the development of intellectual capital model was build relying on researcher's work and gives effort for emergence of common and general understanding of the field. It was easy following the steps in the model test it in the retail companies because the model is a form of communication with aspects of customer-relations, employee development, customer- and employee-satisfaction, effectiveness of processes, and certain forms of new ideas in areas of product development and process improvement. What does Systematic differently here is that the structure of the model according which IC statement is produced is clearly separating the foundation, efforts and results parts as a sequence of all points that compose the model. There are some relevant differences among the Systematic and model used for retail companies and they emerge in their methodology and scope, in the terminology they use and in the way they classify actions and indicators.

The model proposed in this work is aiming to provide practical guidance to firms in the process of managing and reporting on intellectual capital. It recommends to classify different intangible resources and activities, as well as their corresponding indicators, under the following three categories which jointly structure the intellectual capital of the firm (human, structural and relational capitals). While Systematic distinguishes people, customers, processes and technology only the components of the three IC pillars. What Systematic also stresses in the “value in use” that creates value for users, relying on many factors and efforts company takes to meet challenges, it is more concentrated on how to report intellectual capital with few indications how to manage it. While the model proposed brings the focus on how company, through connectivity of its intangibles in a network, culture and relations, implement its objectives and by this focus on how to create value for various stakeholders. It starts with the management process and continues to reporting process.

Model tested in retail companies also contains some drawbacks mainly resulting from lack of metrics unification. Measurement system development is very time consuming and being no unified system it makes the measurement of IC more difficult as well as interpretability of the results as there is no synthesis. However the strength is the development of the conceptual framework that might be widely accepted because of its universality. While Systematic model’s strength is its more user-driven approach, it is more practical and realizable mainly because it was already tested in many companies (with a few changes) in Denmark and has its history already.

Despite the problems mentioned, the attention brought to the value which is gained by intellectual capital management in the company (the fact that a company can have a greater financial result investing in its intellectual capital, new basis for deciding about company’s future, presentation to customers and employees, more sustainable competitive advantage). And it is important here to notice that retail companies had a possibility to sort out management challenges to improve and develop intellectual capital in the organization for greater further results and recommendation for the companies would be to implement the intellectual capital management process, continue the surveys, adopt the retail specific indicators if needed and continue with reporting processes to make its knowledge resources and key competency areas visible and present the companies in interesting way to its internal and external customers. Hence, below there is mentioned what those external and internal customers as well as the companies themselves might gain from the management of intellectual capital.

<i>The customers gain:</i>	<i>The employees gain:</i>
• Confidence that they will get what they have goods what they have need for • Better and faster service as a result of increased performance improvement (investments to technologies and trainings) • A long-term partnership for future	• More professional working environment • Time for new ideas and knowledge sharing • Less fire fighting and overtime work, increased job satisfaction • Improved CVs.

Companies LT, LV and EE gains:

- Financial advantage. Most of the articles show that improving processes is great business. Companies spend a lot of project hours on correcting mistakes and dealing with unsatisfied customers. This rework is reduced with increased process maturity and development.
- Competitive advantage. High investments to human resources, processes, systems and relations shows that companies has an opportunity to develop faster, achieve higher quality results, satisfaction of customers and employees that leads to loyalty.

Finally, the intellectual capital model testing had some impacts as the companies were involved in the research and employees donated their time to answer the questions. Therefore, companies, at least in Lithuania, promised to analyze the intellectual capital model and the results of testing it deeper in order to show the company's management is mission-oriented. It is to form the basis for future development of the company through improved knowledge management that makes knowledge sharing more efficient and promotes knowledge development. Furthermore, satisfaction indicators, good or bad, will make company take actions to improve unsatisfactory results. Sharing the intellectual capital model results between customers, partners, employees and competitors might contribute to creating new contacts to future job candidates, to customers and to future partners and suppliers.

Conclusions

Countries are rapidly moving towards a knowledge-based economy where intangibles are increasingly related to a firm's value-creation process. Therefore, firms need to be able to identify measure and manage their intangible assets as well as to disclose them internally and externally. This means to be able to inform internal and external stakeholders the true abilities of the company as well as potential for the future and ease of management decisions.

Analysis made in research thesis allows to make such conclusions:

1. The concept of intellectual capital management is still developing, especially in Lithuania. It explains that knowledge, collaboration, and process-engagement create decisions and actions that lead to cost allocations, productivity, and finally financial performance. Theory analysis shows that it is expedient for companies to try to support and maintain knowledge flow, processes and technology updates, increase customer satisfaction and loyalty and gain higher financial results.
2. According to most of the literature analyzed there are three main components of intellectual capital: human, structural and relational capitals. Most common difference in IC structure is re-labeling of components and measures. The methods of IC measurement are divided into 4 groups: market capitalization methods (MCM), return on assets methods (ROA), direct intellectual capital methods (DIC) and scorecard methods (SC), all of them have advantages and disadvantages. While researches developed models and explained how complex the intellectual capital management process is, some companies, notably from Scandinavia, have developed their own measurement models. The comparative analysis of IC measurement methods allowed to conclude that the most common, suitable and up-to-date are scorecard methods as they are most practically tested, involve many indicators that allows to analyze IC from different perspective. Important differences in the models are about value creation, how the concept of knowledge is apprehended and the reporting and categories used for indicators when disclosing information.
3. Since the field is still in its development stage, no one is willing to give up their own view and build off each other's work leaving IC management without unified system. As it is important for the development intellectual capital model was build relying on researcher's work and gives effort for emergence of common and general understanding of the field. Model into account time (focus on long-term), environment, vision and knowledge, system of indicators to measure

intellectual capital (structured from human, structural and relational capitals), action, report and development that leads to value creation. It differentiates itself in the pool of other by being flexible and not sophisticated. It gives a thorough, comprehensive and consistent view how to manage the intellectual capital. It is not based on specific industry or company and provides step-by-step procedure from intellectual analysis, ideas and goals, through system of measurement that further leads to result solving intellectual capital management problem in a company. Indicators list made is based on most frequently used indicators in the theoretical research. There is a possibility left to diminish or increase the number of indicators depending on the industry or specific company needs. Model is broader than presented by others and attempts to avoid superficiality. That makes it similar to direct intellectual capital and scorecard methods, but also excluding it because of versatility and more coherent parts. Model also has drawbacks mainly resulting from lack of metrics unification.

4. As the intellectual capital management requires great information disclosure, neither of the biggest retail industry companies agreed to share this information needed to test the intellectual capital management model because of confidentiality and researches revealing IC were not made inside the companies. The model itself does not give any great benefit if not analyzed, only first ideas of hidden assets in the company and their activities that are unseen but however have impact on company's results. Consequently, the smallest retail chain in Lithuania agreed to share information and participate in the testing of the model. The research was based on questionnaire survey made in companies where the model was tested and abyssal interviews were used for other market players. It was easy to apply the model in retail industry companies mainly because of the focus on how company, through connectivity of its intangibles in a network, culture and relations, implement its objectives and by this focus on how to create value for various stakeholders.
5. The model testing allowed not only to analyze the environment, knowledge navigation and systems but also resulted in IC indicators, the comparison of which uncovered challenges management has to cope with. The testing of the model showed that companies are mostly concentrating on their human and structural capital, as most of the measures were used and need to work on the relational capital. The model tested and indicators calculated revealed some challenges for the management of the companies: to shorten decision making process regarding business processes and policies of the companies to assure constant work, retention of employees is a challenge for Estonian company in order to avoid leak of knowledge, competencies development of the employees required in LV and EE, decreasing employees

satisfaction with their work place in LT company requires management attention, etc. It provided the tool and guidelines for the management how to monitor, disclose and manage knowledge base resources.

6. By shortly analyzing the model and results it gave companies are eager to increase their human capital by with the management development; online questionnaire is being developed to finding out more about their employees' satisfactions and dissatisfactions, to increase their processes with the creation of the new HR system, SAP system, to strengthen relations with customers developing new campaigns and agreements with the suppliers. Hence, intellectual capital management model can work in the companies where it has been tested, company donated time and efforts to develop the indicators, now the greater management analysis is required, development of IC, structuring of the results and start thinking of reporting to its internal and external customers.

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Appendices

Appendix 1

Questionnaires used for survey and experts interviews

Questions for experts interview

1) How many people works in administration? _____	2) Sex distribution: Men% _____ Women% _____	3) What % of administration employees has higher degree? _____ Working students %? _____	4) How many managers work in administration? • <10 • <20 • <30 • <40 Other (type in) _____
5) How many project managers work in the company? • 1-4 • 5-7 • 8-12 • 12-20 • Other (type in) _____	6) Training days per employee per year • <10 • 10-15 • 15-20 • 20 ir > • Other (type in) _____	7) Training costs per employee per year _____	8) How many employees has international work experience (associated with current position)? _____
9) Do you have experience and knowledge sharing meetings? • Yes • No	10) IT employees number? • 1-4 • 5-7 • 8-12 Other (type in) _____	11) How many promotions are done during the year? • 1-6 • 7- 12 • 13 ir >	Career planning is made for all employees? • Yes • No
12) What is average administration employees turnover? • 5% • 5 – 10% • 10 – 15% • 15 – 20% • 20% and more	13) % of inter-departmental projects • 5% • 5-7% • 7% and more	14) Employee job satisfaction • 25% • 25 – 50 % • 50 – 75% • 75 – 100%	15) How many new employees are recruited into a company during a year? • 5 – 10 • 10 – 20 • 20 – 25 • 25 – 35 • 35 and more
16) Sick leave % • 1 – 3% • 3 – 5% • 5% and more	17) What % of employees has computers? • 40 – 60% • 60 – 80% • 80 - 100%	18) Intranet usage • Taip • Ne	19) How many projects lasts more than 6 months? _____
20) Yearly investment to IT technologies? _____	21) What is the average project team size? • 2 – 4 • 4 – 6 • 6 – 8 • 8 – 10 • 10 and more	22) % of employees satisfied with their work place? • 20 – 40% • 40 – 60% • 60 – 80 % • 80 - 100%	23) % of employees satisfied with IT equipment • 20 – 40% • 40 – 60% • 60 – 80 % • 80 - 100%
24) The number of biggest suppliers • 5 – 10	25) % of employees participating in yearly conferences? • 5 – 10 %	26) Do you have any relationships with schools or universities?	

• 10 -15 • 15 – 20 • 20 – 25 • 25 – 30 • 30 and more	• 10 -15 % • 15 – 20 % • 20 – 25 % • 25 – 30 % • 30 and more	• Yes • No	
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Survey questions:

- I have a computer for my work
 - Yes
 - No
- I have foreign work experience
 - Yes
 - No
- I have participated in international projects associated with my work
 - Yes
 - No
- I have been promoted
 - Year 2007
 - Year 2006
 - Neither

- I am satisfied with my job (5 being the highest)

1	2	3	4	5
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- I use intranet a lot
 - Yes
 - No

- I have a possibility to work at home
 - Yes
 - No

- I am satisfied with my work place

1	2	3	4	5
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- I am satisfied with IT equipment

1	2	3	4	5
---	---	---	---	---

- I think internal newspaper is a great idea and read it

- Yes
- No

- I participate in yearly conferences

- Yes
- No

Sex: • Man • Woman	Age: • 18-24 • 25-29 • 30-34 • 35-44 • 45-55 • >55	Background: • Secondary • Professional • Not finished higher degree • Bachelor degree • Master degree	Seniority: • <1 • 1<2 • 2<3 • 3<5 • >5	Position: • IT employee • Project manager • Other (type in):
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Appendix 2

Key figures of Systematic Software Engineering.

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Key Figures

The Group (1000 EUR)	2004/05	2003/04	2002/03	2001/02	2000/01
Turnover	29,100	29,370	31,435	24,982	17,811
Operating profit	667	763	4,691	3,194	2,128
Net financials	155	(71)	-93	129	74
Profit for the year	743	474	3,124	2,249	1,485
Balance sheet total	19,412	17,191	18,816	14,864	8,546
Cash at bank	4,900	5,570	4,763	4,479	913
Equity	7,400	6,646	7,507	5,379	3,774
Innovation (process improvement and product development)	4,852	5,275	4,705	2,832	1,935
Ratios					
Profit ratio	2.3%	2.6%	14.9%	12.9%	11.9%
Return of equity	10.6%	6.7%	48.5%	49.1%	39.4%
Equity ratio	38.1%	38.7%	39.9%	36.2%	44.2%
Number of employees at year end	353	363	344	288	205
Ratio of software engineers holding a Master or PhD degree	71%	71%	70%	63%	62%
Turnover per employee (Average employees, 1000 EUR)	84	83	102	102	99

Facts and figures about the financial year

The accounts for the financial year 2004/05 meet expectations, but do not live up to long-term targets. The results can be summarised as:

- Group turnover of 29.1m EUR, which is on par with the previous year
- Profit after tax 0.7m EUR compared to 0.5m the previous year
- Equity 7.4m EUR and equity ratio 38%
- Sound liquidity and no bank debt
- Investments of 4.9m EUR in product development and process improvement, of which 2.9m EUR were charged to the profit and loss account, and 2.0m EUR were capitalized.

The turnover was affected by fluctuations in public spending and structures, which have a greater impact due to our being a project oriented software company with mainly public customers. The implementation of the Danish Defence Agreement 2005-2009 and the comprehensive structural reform affecting the counties (hospital owners) had a negative impact on the Defence and Healthcare business areas.

The order situation during the first months of the accounting year was adversely affected by the loss of an extension to a large NATO-related subcontract. Consequently, we were compelled to reduce the staff numbers by 28, all of whom were relieved of their duties and offered outplacement consultancy. By the year end, the order book and order pipeline were satisfactory, and staff numbers were almost back to previous levels.

73% of the group turnover in 2004/05 was generated from project sales, 17% from license sales of the Company's software products and 10% from professional services. Exports represented 43% of turnover.

The operating profit of 0.7m EUR equates to a net profit ratio of 2.3%. Profit after tax and minority interests being 0.7m EUR compared with 0.5m EUR in 2003/04.

Equity as at September 2005 was 7.4m EUR, corresponding to an equity ratio of 38%. Return on equity was 10.6%.

Systematic has a sound liquidity and no bank debt. By the year end liquid assets amounted to 4.9m EUR (in the parent company 3.4m EUR).

Investments in product development and process improvement amounted to 4.9m EUR, equating to 17% of the turnover. 2.0m EUR of the investment was capitalised in the balance sheet as intangible assets.

Highly trained employees and intensive competence development

At the year end, staff numbers stood at 353 (305 in the parent company) and were characterised by a high level of education. 71% of all software engineers hold a university degree at masters or PhD level, primarily in computer science or software engineering. The average number of employees, across the financial year, was 348 (300 in the parent company). The average age of employees in the parent company was 34 years.

Systematic places an important emphasis on employee satisfaction and an open and constructive dialogue, not only within the teams and projects, but across the entire Company. To support this we conduct employee satisfaction surveys on an annual basis. The survey carried out in September 2005 showed an average satisfaction score of 3.84 on a scale from 1 to 5. The survey also showed that 38% of employees were "fiery souls" characterized by a high level of loyalty and commitment. On the basis of our saying: "Better train people and risk they leave – than do nothing and risk they stay", we offer a comprehensive program of further training. The program contains an aggressive plan for employee certifications, partly aimed at core central technologies such as Microsoft, Java and Oracle, partly focussed on project management (PMI), test (ISEB) and operational tasks (ITIL).

Last year, 81 software engineers completed a certification, of which the majority achieved one of the more demanding certifications, consisting of several exams, such as Microsoft MCSD and Java Architect. 13 project managers completed the demanding Project Management Professional exam. In this way, Systematic acquires valuable and demonstrable knowledge, whilst employees receive cash benefits and can improve their CVs.

Each employee had an average of 9 training days in 2004/05. The direct costs for course and training programme, including pay rises for successful certifications, amounted to 0.7m EUR. When the investment in working hours and time for course administration is included, the total investment corresponds to approximately 9% of salary costs.

Appendix 3.

Managing the Intellectual Capital

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1. Introduction

Today's economy is changing very fast making it difficult for companies to sustain competitive advantage and add value. Business that is oriented not only to its physical assets but also to its intangibles has more opportunities to be successful. The growth of information and knowledge led to increased interest in intellectual capital. As for many years it meant only brand today intellectual capital is understood more broadly: the possession of the knowledge, applied experience, and professional skills which when motivated in a right way, developed into customer or supplier relationships adds value to the development of organization (Canadian Council of Human Resources Associations). [10] Companies are trying to adopt their activities to intangible economy and to develop systems to measure and manage intellectual capital because of the value it can bring. This interest was mainly influenced by two events in business environment: shift from production based economy to service and knowledge based one and the first thoughts about invisible balance sheet (doubt of financial reporting). According to Brennan and Connell, 2000, substantial differences between company book values and market values indicate the presence of assets not recognized and measured in company balance-sheets. Intellectual capital assets account for a substantial proportion of this discrepancy.[3] Measuring and reporting intellectual capital is not meant to be a substitute for traditional accounting measurement practices, but rather as a supplement that gives a better understanding and ability for potentials to make a right decision.

The *purpose* of this article is to propose a model for intellectual capital management that is increasingly related to a value-creation process of an organization (not only knowledge – intensive organizations but also every business attempting to be successful in fast changing environment).

The main function of intellectual capital management in company's management process is the information needs satisfaction of both internal and external stakeholders that enables management decision-making competitive advantage development. However companies face two main problems when trying to manage their intellectual capital. First one, there is no common framework or tool for the management of intellectual capital and the measurements have the greatest utilitarian value when there is a possibility for comparison. The value will increase when IC will be managed over years and when information adds knowledgeable value about the situation. The second problem is the decreasing relevance of financial reports, because they are not capturing new sources of company's value. Therefore supplements such as intellectual capital reports became relevant. [2, 4, 7] The model proposed in this article might be a step to solving these problems and input in intellectual capital management problems. Other model presented by the researches are oriented on their own "view" and still don't build on others models made to manage IC, though the whole concept lack consistency and a good structure. [5, 7]

2. Reasons to Manage Intellectual Capital

The changes in the economy and growing need for disclosure of what company does to enhance its knowledge resources for achieving better results in the future enforces to research intellectual capital. As the subject is still in its initial stage there are many definitions of intellectual capital. One of formulations for identifying the value of intellectual capital proposed by most of the resources analyzed is that the value of the company's *IC assets is the difference between the company's book value and market value*. And this value is not presented in annual reports. The Figure 1 presents the three parts of intellectual capital that are interacting in the process:

Human capital. The knowledge that employees take with them when they leave the firm. It includes the knowledge, skills, experiences and abilities of people.

Structural capital. The knowledge that stays within the firm at the end of the working day. It comprises organizational routines, procedures, systems, cultures and databases.

Relational capital. All resources linked to the external relationships of the firm. It comprises the part of human and structural capital involved with the company's relations with stakeholders (investors, creditors, customers, suppliers, etc.) plus the perceptions that they hold about the company.

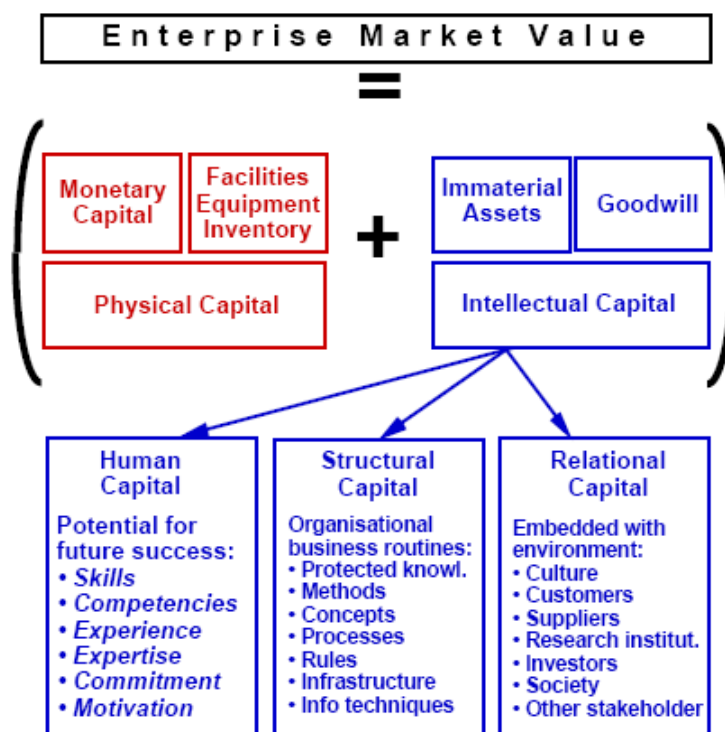


Figure 1. Intellectual Capital (T. Auer, 2004)

Under these three parts fall all the activities and resources of intangibles together with the indicators that coincide. Figure clearly shows that together with the book value (accounted by financial reports) intellectual capital constitutes the market value of the firm.

Much is written about necessity to link intellectual capital of the firm to the mission and strategic objectives, and a number of companies have been experimenting with intellectual capital management frameworks that attempt to achieve this. [4, 7] Danish software engineering company [11], one of the pioneers in the field of intellectual capital, distinguished internal and external causes to measure intellectual capital:

- o *Internal reasons:* businesses make their knowledge resources and key competency areas visible, and monitor management's efforts to develop these. Also, management is able to establish a new basis for deciding about the firm's future. Important here that working with intellectual capital is not something that is done at the top level, but also involving other employees, that improves everyday performance. It has created initiatives to share knowledge including a mapping of competencies and, heightened attention to the development of competencies, mapping of processes and introducing knowledge agents and mentors. IC measurement is also a base line for justifying investing in knowledge management activities.
- o *External reason:* businesses have a possibility to present themselves to customer and employees, and to co-operating firms and other interests, in an "interesting" way. Present the reliable information (true abilities) concerning both current company's situation and its potential for the future. This important in competitive environment to decrease the gap of knowledge (of strengths and possibilities) that stakeholders get from company itself and the surrounding. Possibility to attract new team members and get network relations to series of firms interested in competency development.

These are the main motives to distinguish intellectual capital as an internal management tool and as an external system for reporting intangible data. It is important for company to use and to take advantage from the reasons mentioned.

3. The methods to value intellectual capital

From all the efforts to manage measure and report the intellectual capital of a firm, each has taken somewhat different approach. Different models developed by different authors distinguish more features and opportunities of intellectual capital

management. However the topic is still developing and researchers are developing their own models rather working on the others in order to general understanding of the field to emerge.

The suggested measuring approaches for intangibles fall into at least four categories of measurement approaches. The categories are an extension of the classifications suggested by Luthy (1998) and Williams (2000) and described by Sveiby (2001). [9]

- *Market Capitalization methods (MCM)* are mostly used for stock market valuations and are good for illustrating the financial value on intangibles. They calculate the difference between a company's market capitalization and its stockholders' equity as the value of its intellectual capital or intangible assets.
- *Return on Assets methods (ROA)* are popular when comparing the companies in the same industry. In this method average pre-tax earnings of a company for a period of time are divided by the average tangible assets of the company. The result is a company ROA that is then compared with its industry average. The difference is multiplied by the company's average tangible assets to calculate an average annual earning from the Intangibles. Dividing the above-average earnings by the company's average cost of capital or an interest rate, one can derive an estimate of the value of its intangible assets or intellectual capital.

These two methods are great for illustrating the financial value of intangible assets, a feature, which tends to get the attention of the chief executive officer. Because they build on long established accounting rules they are easily communicated in the accounting profession. Their *disadvantages* are that by translating everything into money terms they can be superficial. The ROA methods are very sensitive to interest rate and discounting rate assumptions and the methods that measure only on the organisation level are of limited use for management purposes below board level. Several of them are of no use for non-profit organisations, internal departments and public sector organisations; this is particularly true of the MCM methods. [4, 9]

- *Direct Intellectual Capital methods (DIC)* encompass mostly narrow value part of a business. Estimate the monetary value of intangible assets by identifying its various components. Once these components are identified, they can be directly evaluated, either individually or as an aggregated coefficient.
- *Scorecard Methods (SC)* can encompass great number of intellectual capital resources and indicators. The various components of intellectual capital are identified and indicators are generated and reported in scorecards or as graphs. SC methods are similar to DIS methods, expect that no estimate is made of the \$-value of the Intangible assets. A composite index may or may not be produced.

The *advantages* of the DIS and SC methods are that they can create a more comprehensive picture of an organisation's health than financial metrics and that they can be easily applied at any level of an organisation. They measure closer to an event and reporting can therefore be faster and more accurate than pure financial measures. Their *disadvantages* are that the indicators are contextual and have to be customised for each organisation and each purpose, which makes comparisons very difficult. The methods are also new and not easily accepted by societies and managers who are used to see everything from a pure financial perspective. These approaches can generate a lot of data, which are hard to analyse and to transfer. [4, 9]

The two scorecard methods are used more broadly than the other ones, because of the great contribution of researchers. They are arguably the most relevant guidelines in place aiming to provide practical guidance to firms in the process of managing and reporting on intellectual capital. Among existing initiatives, they probably have the strongest institutional and corporate support: [6]

- *Meritum Guidelines* has general aim to improve the policy-making capabilities of the European Union in the realm of science and technology policy, and particularly innovation policy, by providing a consistent basis for the reliable measurements of intangible investments. The Guidelines for the Management and Disclosure of Information on Intangibles are part of the Meritum project.
- *Danish Guidelines* describes how to prepare an 'Intellectual Capital Statement' in practice. It includes in-depth examples from the intellectual capital statements prepared by seventeen Danish companies. The Guideline emphasizes that the intellectual capital statement is an integral part of working with knowledge management within a company, but does not specifically describe a model for knowledge management.

The strength of the Danish Guideline is that they are more user-driven, more practical, more implementable, while the main value of the MERITUM Guidelines is the knowledge and consensus that was built among the different countries that were involved. [5]

While researches developed models and explained how complex the intellectual capital management process is, some companies, notably from Scandinavia, have developed their own measurement models. It should be pointed out that all those mentioned derive at least a part of their income from consultancy and therefore have a commercial interest in promoting their models. Elsewhere the development and use of IC models is patchy. Mainland Europe is probably the least advanced, with the UK and US a little further ahead. The pacific countries such as Australia and Japan, on the other hand, have recently made strong advances. The individual company models distinguished (D. Starovic, B. Marr, 2002): *Skandia navigator*; *Ericsson's cockpit communicator*; *Ramboll's holistic company model*; *Bates Gruppen Company IQ measurement system*. [8]

Growing evidence supports that the accumulation of intellectual capital is outpacing the accumulation of physical capital as the key driver of competitiveness in the so-called new economy. At the aggregate level, innovation through the development of intangibles has a strong impact on productivity. At the firm level, empirical studies show that innovative firms are financially more robust and generate higher employment. [7] However, lack of comparative analysis makes it difficult to discover the best intellectual capital management model and the intention of every model's authors to suggest something new to the topic doesn't ease the situation. The practical purpose and aim of managing intellectual capital is to provide management with a unified, consistent, comprehensive, structured and tested tool for monitoring and disclosing information about their activities and efforts to manage the company's knowledge base. Therefore a model proposed further might be recognized as the tool required by the management of the companies to manage their intellectual capital and take the competitive advantage created.

The *core of the model* Figure 2 is that value creation process is presented in a broader context still relying on three main parts of intellectual capital. Relationship and interaction of activities brings to a greater result. The model proposed is not based on specific industry or company it is broad – based applicable.

Remembering the value of IC, it is seen that the model contains both financial and non-financial blocks that combine to estimate the company's market value. IC management and reporting is not to substitute the traditional financial reports, but is as a supplement, relying and using *FINANCIAL FIGURES* as the base for development. The calculation of the indicators relies on the financial numbers of the company. It is important for a company to analyze the *ENVIRONMENT* of the industry and decide if the management of IC is necessary. Clear articulation of the *VISION* encompasses the identification of key intangibles to reach the objectives. It important for measurements to support vision of the company and decision how to put vision into system of measurement emerges in this stage. The *KNOWLEDGE* here is defined as the mean to explain how the products or services supplied by the company create value for users, and what management must do in order to deliver this value. The knowledge takes the company's mission as its starting point; participants of Nordika project states that practical knowledge is what matters in an IC management process: knowledge of the company that in terms of the value in use can offer its customers through its products or services. Also *KNOWLEDGE* presents the new ideas of the company that are accomplished by the interaction of the human, structural and relational capital.

SYSTEM OF INDICATORS ties the vision of the company with the core of intellectual capital. In this model are they are the presentation of what company is doing with its intangibles and it allows for the stakeholders to see how company is doing fulfilling its objectives. As the indicators might be general, industry- or company- specific (concerning what is of most importance to a company) they still should refer to three categories of IC (human, structural and relational capital) and give an understanding of the hidden processes of organization that also generate value but are not recognized in traditional measurement. These are non-financial numbers that do not attempt to put a financial figure on the value of intangibles, but instead measure processes or results that are dependent on it. There is a risk here in identifying the key success factors of the organization, too much weight might be put on the part of IC that is not key intangible in value creation process.

In the *ACTION* phase it is important to link the indicators results with the challenges, routines and activities of management, trying to identify the impact of the intangibles. In other words identify that knowledge resources are important factors in company's activities and have impact in efficient and competitive operation and need to be shared and developed. *REPORTING AND DEVELOPMENT* leads to *VALUE CREATION PROCESS*: increased disclosure to company's stakeholder - encourages investors to take decision faster (saves time and increases value of money), increases customer reliance, etc., ease in management decisions – more efficient performance, effective resource management, maximized productivity of knowledge and usage, management information system created that leads to lower resistance to change, faster share of information, continuous learning etc. The value creation process here means to create more value via transformation and improvement of company's knowledge, routines and practices.

Model takes into account the *TIME* perspective having in mind that the largest value can be taken from the measurement system of IC when there is a possibility to compare it in time as well as in space.

The model presented in this article gives a structured picture how to accomplish information disclosure for stakeholders and easier management decision making. However, since the field of intellectual capital is still in its early development stage, no one is willing to give up their own “view” and build on each other's work many models are being developed. Model proposed in this article has some distinctions in the pool of others. The greatest advantage of it is that it gives a thorough, comprehensive and consistent view how to manage the intellectual capital. It is not based on specific industry or company and provides step-by-step procedure from intellectual analysis, ideas and goals, through system of measurement that further leads to result solving intellectual capital management problem in a company. Model is broader than presented by others and avoids superficiality. That makes it similar to direct intellectual capital and scorecard methods, but also excluding it because of versatility and more coherent parts. As it is important for the development of intellectual capital model was build relying on researcher's work and gives effort for emergence of common and general understanding of the field.

Model also contains some drawbacks mainly resulting from lack of metrics unification. Measurement system development is very time consuming and being no unified system it makes the measurement of IC more difficult as well as interpretability of the results as there is no synthesis. Despite the problems mentioned, the attention brought to the value which is gained by intellectual capital management in the company (the fact that a company can have a greater financial

result investing in its intellectual capital, new basis for deciding about company's future, presentation to customers and employees, more sustainable competitive advantage).

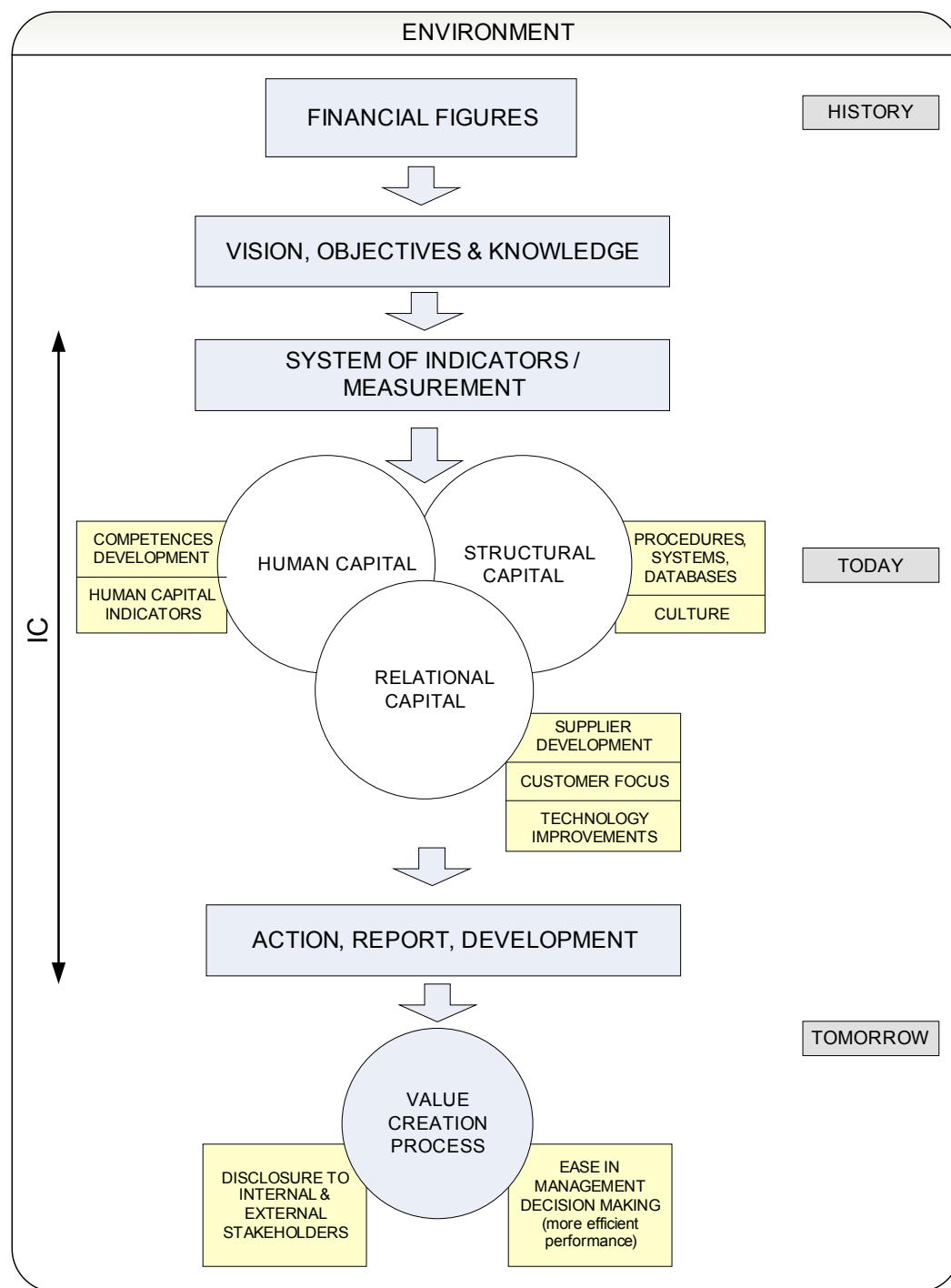


Figure 2. Intellectual Capital Management Model

4. Conclusions

Countries are rapidly moving towards a knowledge-based economy where intangibles are increasingly related to a firm's value-creation process. Therefore, firms need to be able to identify measure and manage their intangible assets as well as to disclose them internally and externally. This means to be able to inform internal and external stakeholders the true abilities of the company as well as potential for the future and ease of management decisions. The model proposed in this article has

some distinctions in the pool of others described. The biggest advantage is a comprehensive, thorough and consistent view how to manage the intellectual capital. Model is broader and has no ties with any specific company or industry. It is one of the efforts that lead to emergence of common and general understanding of the field. However some drawbacks of the model are seen mainly because of lack of metrics unification that makes measurement system hard to come up with. The interpretability of the results also adds weakness for the model. However intellectual capital management model developed is a combination of the human, relational and structural capitals resources of the organization plus other influencing parts and the connectivity between these elements when organized properly produces value for the future.

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INTELEKTINIO KAPITALO VALDYMAS

Dovilė Buinickaitė, Arnoldina Pabedinskaitė

Santrauka

Straipsnyje nagrinėjami intelektinio kapitalo valdymo ypatumai, išskiriami pagrindiniai intelektinio kapitalo elementai, kuriems sąveikaujant tarpusavyje bei juo tinkamai valdant atskleidžiama intelektinio kapitalo nauda. Straipsnyje pateikiamos pagrindinės priežastys sukėlusios susidomėjimą intelektinio kapitalo valdymu, analizuojamos ir lyginamos tyrėjų idėjos intelektinio kapitalo valdymo tema. Didelis dėmesys skiriamas intelektinio kapitalo valdymo vertei: tai būdas pristatyti kompanija klientams ir darbuotojams, įgyti konkurencinį pranašumą, galimybė pritraukti investuotojų dėmesį, palengvinti kasdienes organizacijos sprendimus bei galimybė vadovams įvertinti kompanijos ateitį. Išanalizavus teorinius intelektinio kapitalo valdymo aspektus, straipsnyje pateikiamas išsamus intelektinio kapitalo valdymo modelis bei aprašomos pagrindinės jo dalys. Šio straipsnio tikslas:

- pateikti intelektinio kapitalo valdymo modelį, atsižvelgiant į tai jog intelektinis kapitalas susijęs su vertės kūrimo procesu organizacijose (ne tik žinių organizacijose, bet ir kiekviename versle, kuris siekia būti sėkmingas greitai kintančioje aplinkoje).

Raktažodžiai: intelektinis kapitalas, intelektinio kapitalo valdymas, vertės sukūrimas, žmogiškasis kapitalas

Appendix 4.

The Indicators used to develop an Intellectual Capital Management Model

HUMAN CAPITAL

Indicator	Calculation	Purpose
Highly trained people	% of employees with a high education, intermediate, basic school	Indicates how company can handle different kinds of work
Training activities	a) Total number of training days received by managers to total training days b) Total training cost per key employee	The number of training days may be used as background information; however the figure is most often related to management challenges The training costs indicate how much the company is willing to invest in retaining its employees by providing supplementary training, and how the company prepares for future challenges by developing the competencies of its staff. The costs can thus be a competitive parameter in recruiting new staff.
Job rotation	% of workforce to rotate their job every year	Job rotation, promotions are indicative of staff flexibility and mobility, development of employee competencies through new challenges, retention and dissemination of knowledge.
Flexibility-Structural Capital	a) % of the projects that are based on inter-departmental cooperation b) Average employee satisfaction with the work organization	Indicates how experience and knowledge can be shared internally in the organization Shows whether the company lives up to the employees' requirements and expectations
Average seniority	Average seniority/number of employees	Shows the average length of employment of the company's employees. It relates to the company's ability to retain employees, which in turn gives indications about working environment and loyalty. It also relates to the need to attract new employees and the need for new knowledge and expertise. This indicator is typically related to management challenges such as developing expertise, recruiting, retaining and integrating employees
Competency and career planning	Number of employees with a competency development plan / number of employees	Competency and career plans are comprised in the employees' personal development plans, evidencing that the company focuses on the individual employee's knowledge development, skills, expertise and responsibilities. This indicator can be used as background data and to explain a management challenge, e.g. in relation to attracting and retaining employees or competency development.

Employee satisfaction	Number of employees who are satisfied or very satisfied / number of employees calculated from a scale. Measurement should take place periodically, for instance once a year. The actions taken should be allowed to take effect before a new measurement is made. The measurement of employee satisfaction is often linked to the measurement of issues such as physical and working environments, development opportunities, salary terms and fringe benefits.	Employee satisfaction shows whether a company fulfils employee demands and expectations. It is relevant to compare employee satisfaction with customer satisfaction, as they are often linked. This indicator is used in relation to management challenges such as recruitment and competency development, attracting and retaining employees
Staff turnover	Number of employees leaving the company / total employees	Reflects the rate at which employees leave the company. As with seniority, this rate is an expression of the company's ability to retain valuable knowledge.
Average absence days	Number of absence days/ total work days	Absence is an indicator of working environment, employee satisfaction, routine and non-routine work, etc.

RELATIONAL CAPITAL

Indicator	Calculation	Purpose
Turnover in terms of segments and products	Segment or product group turnover/ total turnover	Turnover divided between segments and products can describe risks and areas to prioritize in the future
Customer satisfaction	Number of satisfied or very satisfied customers/ number of customers (surveyed) Measured on the basis of a scale. For some companies it will be relevant to weight each question in accordance with the relevance assigned to the issue in question.	Customer satisfaction shows whether customer expectations are met with respect to product quality, ability to deliver, service, etc. This indicator often relates to management challenges such as visibility to customers, development of work processes, ensuring high quality, customer orientation.
Communication with universities and schools	Number of universities or schools	Reflects the external relationship
The number of working years with suppliers	Number of years	Indicates the development of relationship and loyalty
New suppliers number per year	Number of new suppliers / total suppliers	The entry of new suppliers will typically be related to management challenges describing how well the company fulfils needs
PCs per number of employees	Number of PCs / Number of employees	The indicator PCs per number of employees shows whether the company keeps up to date with technological developments, giving opportunities for exchange of information via the company's intranet and the Internet. The indicator is used as background information.
IT costs	IT cost/turnover	The indicator IT costs shows the

		priority given by the company to having updated technological equipment, supporting the processes that are the platform for employees' work and customers' access to the company.
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STRUCTURAL CAPITAL

Indicator	Calculation	Purpose
Internal knowledge sharing	Number of updated knowledge documents on the company's intranet or number of virtual expert centers	Internal knowledge sharing typically relates to the management challenge of cross-departmental cooperation
R&D costs	R&D costs/Turnover	The indicator R&D costs shows the costs incurred by the company in order to reach its present level of expertise and the competencies the company is about to build. This indicator also shows how innovative the company is and how it safeguards itself for the future. The indicator is often used for management challenges, such as being innovative, establishing flexible and up-to-date environments, developing and improving advanced distribution systems and process improvement and project management. The indicator can also be used for background information.
Quality certificates	Number of certificates gained over a year	Indicates process improvements
Upgrades of the Database	Number per year	Shows whether the company is technologically updated
Number of patents	Number of patents registered over the last year	Shows increasing research activities