ESSAYS ON MANAGING KNOWLEDGE AND WORK RELATED WELLBEING
Essays on Managing Knowledge and Work Related Wellbeing

Key words: Knowledge Management, Work-related Wellbeing, Intellectual Capital, Maintenance of Work Ability, Knowledge Creation, Occupational Health and Safety

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To Taina and Tuure
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1 INTRODUCTION

The logic of how organisations cope with competition challenges has turned upside down during the last two decades. Business process re-engineering, lean management and other approaches to trim organisations have been replaced by an emphasis on retaining qualified and technically proficient workers. (Fields, 2001; Eisenberg, 1997.) Therefore, it has become increasingly important that organisations pay attention to the wellbeing of their employees.

The general conclusion of the articles that constitute this thesis is that organisations have to take care of their employees’ wellbeing in order to secure innovativeness that is the key to surviving in a modern ultra-competitive business environment. Failure in the competition for constant renewal results in becoming obsolete because competitors are able to provide more sophisticated solutions and it has been widely discussed in the literature see, for example, Terziovski 2004; Peters 1988; Waterman 1988; Deming 1986; Goldsmith –Clutterbuck 1984. However, the importance of wellbeing as a prerequisite of innovativeness has not been tackled.

This thesis contains five essays that discuss different perspectives in relation to intellectual capital. Conceptual considerations are included because many concepts are used in this discourse and their mutual relations needed further scrutiny. A firm level analysis is made in order to study knowledge management practices that companies are currently undertaking. The employees’ wellbeing perspective is discussed in essays three and four by scrutinising interview data on experts in intellectual capital and the maintenance of work ability. Essay five links the discussion around the maintenance of work ability in business administration studies. This repertoire of different perspectives lays the groundwork for an argument that taking care of employees’ wellbeing is beneficial for an organisation’s ability to create new knowledge and thus come up with innovations.

However, before presenting these research essays, this overarching essay provides an overview of the literature on intellectual capital and the maintenance of work ability and discusses the limitations of the study. Furthermore, the methodological and method solutions of the study will be presented and discussed. After describing the research essays, this overarching essay ends with meta-level conclusions that combine the insights of the separate articles. The actual research articles are available as an appendix following this presentation.

The following theoretical sections exploring the literature on the focal frameworks are not structured to present these concepts in a detailed manner for two reasons. Firstly, the aim of this introductory literature review is to shed light on the societal settings from which these frameworks have emerged. Secondly, the mainstream definitions of both intellectual capital (see Ståhle – Hong, 2003; Andriessen, 2001; Mouritsen et al., 2001) and the maintenance of work ability (see Mäkitalo– Launis, 1998; Mäkitalo et al., 1995) have been criticised for forcing these holistic phenomena into sets of different categories that can be easily separated. For the purposes of this background scrutiny the presentation is outlined in the way that is seen to be more appropriate than following the specific categorisations of definitions. However, the detailed scrutiny of categorisations
in the definitions of these concepts will be presented in the actual research essays, when the “conceptual lenses” of analysis are discussed. Therefore, for more detailed definition on maintenance of work ability, please see essay number three “Intellectual capital and maintenance of work ability” and on intellectual capital essays two “Managing intangible assets – a question of integration and delicate balance” and four “Maintenance of work ability from an intellectual capital point of view”. An elaborated definition of the concept of knowledge management can be found in essay one “Reconfiguring knowledge management – combining intellectual capital, intangible assets and knowledge creation”.

1.1 Changes in working life caused by increasing knowledge-intensiveness

According to the intellectual capital literature information and communication technologies, globalisation and increasing emphasis on intangibles have created a new basis for transactions in the changed markets as the Internet has given access to globalising markets (Sullivan, 2000). Besides technological development, decreasing regulation is conducive to this development. Companies are facing new opportunities through markets opening up, but, on the other hand, they also face increasing competition from Asia, Eastern Europe and Latin America among others (Ghauri, 2000.) Furthermore, the management strategies increasingly emphasise alliances with other companies and strong reliance on intangibles like consumer trust, employee commitment and innovative capacities. These cannot be managed by strategies based on a bureaucratic organisation (Bijlsma-Frankema – Koopman, 2004.)

It is suggested that these alternations break the traditional pattern of incremental and predictable change into non-linear, unpredictable and rapid change – the nature of change has shifted from evolutionary into revolutionary (Prahalad et al., 2000; Eisenberg 1997). On the other hand, the rate of changes is debatable as they are often exaggerated in the short term and underestimated in the long term (Eksted et al., 1999). Yet, it is argued that Western countries have a comparative advantage in the field of intellectual capital, due to stable and well-organised societal settings (Ahonen, 1998).

Because of these changes, all forms of business are seen to become more knowledge-intensive (Stewart, 2003; Ståhle – Hong, 2002; Brown – Duiguid, 2001). Accordingly, production becomes increasingly knowledge-intensive. Therefore, it is the volume of sales that increasingly often makes the difference (Kim – Maborgne, 2000). In the information economy the significance of knowledge and communication are increasing as the sources of wealth, whereas the importance of physical resources is decreasing. In the early years of industrial production during the late 19th century, the production was mainly based on physical assets and the importance of human knowledge was relatively low. In the post Ford era the situation is the opposite. (Stewart, 2003; Salmenperä et al., 2000; Thurow, 1999; Drucker, 1993.)

Companies have often strived for efficiency by reducing the number of personnel, terminating unprofitable functions and applying different process reorganisation techniques (Dive, 2004; Currie – Hlupic, 2002; ten Bos, 2000; Hammer – Champy, 1993.) However, the key to maintaining competitiveness in the modern business world is to shift from control and anticipation to the ability to constantly renew. This is
difficult without strategic reserves in an organisation (Nonaka – Takeuchi, 1995) and, therefore, the conventional mechanistic logic of constantly improving efficiency by slashing the redundant is actually defective in relation to modern aspirations to produce innovations and new ideas and to implement them in the entire organisation. Full-scale use of strategic reserves supports the ability to be innovative in all levels of an organisation. Therefore, they support a company’s abilities to create a variety of ideas leading to competitively relevant innovation creation and usage. Innovativeness as company’s success factor is not just characteristic of individuals’ but, especially, of a company’s systemic qualities. Competencies, interdependency and information flows are the foundation of a company’s systemic qualities. (Ståhle – Grönroos, 2000; 1999.)

As companies move towards a post Ford networked economy, traditional mass production is challenged by flexible production. Customers are unwilling to buy standardised products anymore expecting instead specific and high-quality products that meet their needs. (Stewart, 2003; Prahalad et al., 2000; Kasvio, 1994.) On the other hand, more detailed designs can also be produced and tested as simulated models without producing the actual physical prototype, which makes product development cheaper. Similarly, the need for stored inventory can be reduced. Less storing reduces the need for physical capital (money, raw materials, warehouses) as only the amount needed is supplied. GE Lighting provides an interesting example of these changes. They were able to cut the number of warehouses from 34 to 8 and even more dramatically the number of customer service centres from 25 to one. In this development physical assets have been turned into intangible ones as the use of networks, database solutions etc. has increased. This development trend has considerably increased the profitability of financial investments in productivity. (Stewart, 2003; 1998.) An organisation with flexible differentiation sees products, services, new manufacturing processes and renewal of work organisation as parts of one unitary development process. The core of this process is collective learning. This important learning takes place between organisations, as well as inside an organisation as collaboration between different groups. It is characteristic of this process that it is unforeseeable and collective by nature. (Konstadakopoulos, 2004; Salmenperä et al., 1999.)

Another trend is that bureaucratically-managed organisations are decentralised and activities increasingly take place in smaller, more flexible units. This shift increases the importance of creating collaborative networks. (Prahalad et al., 2000; Kasvio, 1994.) Such collaboration creates a basis for a new kind of value network-thinking, in which companies can focus on highly specific areas and create added value for customers as a part of a larger network. Improved logistic solutions, computer aided designing and efficient means of communication have made it possible for companies to focus on core

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1 It is argued that different economics also require modifications to the value creation logic. The value chain is seen as a valid approach for industries that can break down the value creation of the firm into discrete activities that contribute to the firm’s relative cost-position and create a basis for differentiation. The value chain essentially captures all activities performed by a company. Value networks, on the other hand, are built around the services that engage customers to exercise dependencies among themselves. Different mediators have an important role in this setting. (Stabell – Fjeldstad 1998.) This would suggest that ‘value chain’ is not a suitable term to describe the value creation logics of the intellectual capital. The focus on innovativeness and organisational renewal blurs the clearly defined differentiation between the organisations. Furthermore, the mediating features emphasised in the value network approach are also characteristic of intellectual capital.
activities and out-source others to networked partners. (Prahald et al., 2000; Stewart, 1998a.) Out-sourcing is also an increasing trend in Finnish society (Ylöstalo, 1999). It is characteristic of networked organisations that people aim at collective interpretation and development and solving the more challenging problems innovatively. Mutual trust, freedom, equality, respect and a shared vision are the key elements in this process. (Dixon, 1999; Juuti, 1998.)

Besides changing the processes used to produce goods and services, the use of information technology also challenges the management of these processes. The traditional management hierarchy is no longer the optimal way to organise activities because the knowledge required to manage turbulent changes is not possessed by top management alone. Knowledge creation at all organisational levels is a prerequisite for successful business operations. (Eisenberg, 1997; Nonaka – Takeuchi, 1995.) Companies can aim at producing more value added ideas by increasing their innovativeness. Different organisations diverge in innovativeness. For companies operating in a highly dynamic environment the true change is necessary for survival and security (Lu – Tsai, 2003). Accordingly a considerable proportion of the maintenance and development costs should be addressed to the human resources of an organisation. Therefore, maintenance of work ability and developing employees’ competencies can be seen as a strategic goal. (Salmenperä et al., 2000; Rantanen, 1999.)

Empirical research has shown that the extent to which people are treated with justice in workplaces is related to better health status and, furthermore, the risk to health seems to reduce following favourable changes in organisational justice (Kivimäki et al., 2004). On the other hand, Collins and Porras (1996) studied companies that performed continuously above average and found that these companies have several common characteristics that can be seen as manifestations of responsible management. In this study successful companies had clearly defined core values that make a strong basis for activities. Even though these companies were performing financially well, they were driven by broader goals than money alone. Furthermore, they have a strong focus on continuous improvement and the ability to learn from mistakes. Even so companies more often focus on short-term profit and belittle organisational justice and sustainable economical development.

A study by Juvansuu et al. (2000b.) on the Finnish metal industry and retail trade demonstrated that a long-term personnel policy, that is also available in written form, is empirically shown to correlate positively with an organisation’s success in many measures. Written job descriptions are linked both to good competitiveness and personnel commitment. Well-organised work tasks are a highly important success factor of an organisation as they support competitiveness, the personnel’s commitment and reduced sick leave. Poorly organised functioning and unclear tasks can result in the under utilisation of the personnel’s competencies and, thus, weak productivity. Training also correlates positively with product development and marketing efforts. (Juvansuu et al., 2000a.) The current rate of changes in work life can lead to situations where employees have to finalise previous change processes and at the same time already orientate to a new one. The division of tasks and responsibilities cannot be defined unequivocally so that an employee would be able to perform specifically defined tasks. (Launis – Mäkitalo, 2001.) Therefore, written descriptions are difficult to present in detail but yet they are important in creating collective mastery over work. These
documents form a basis for dialogue and shared problem-solving. Neglecting documentation threatens to turn dialogue into *ad hoc* reactions with no reflection on best practices and observed problems of the past. Systematic planning of development should be tied to the strategy formation of the organisation.

### 1.1.1 From hierarchical management towards empowerment

These changes described above challenge the traditional bureaucratic management of an organisation in knowledge-intensive work. It is characteristic of the traditional ways of thinking that management is built upon supervision, rewards and sanctions, highly differentiated division of labour and performance measurement. The coordination and cohesion of different practices was secured by detailed rules. Such a setting creates low commitment in the employees. In the low commitment organisation there is little or no interest in the needs of a customer or end-user. Furthermore, little attention is given to different techniques being used in the organisation. Management is expected to make all the decisions and the division of labour is highly specialised. Employees do not make suggestions and the work atmosphere is characterised by uncommunicativeness and mistrust. (Boone, 2000; Juuti, 1992.) Employee commitment refers to the psychological attachment of workers to their workplaces (Pillai – Williams, 2004).

A bureaucratic organisation was efficient in mass production, but nowadays empowerment of the knowledge workers is the key to achieving the flexibility needed to meet the rapid changes in the environment. Teamwork helps employees to recognise knowledge and skills they do not possess and how their knowledge of tasks and situations can be broadened by continuing contact with people who have different perspectives (Eraut *et al.*, 2001). Thus, all participants have an equal chance to learn constantly from each other and everyone is committed to provide mutual help and support. This unreserved interaction makes organisational learning possible. (Salmenperä *et al.*, 1999.) According to Argyris and Schön (1978) organisational learning can occur only when its members are allowed to act as learning agents for the organisation, responding to changes in the internal and external environments by detecting and correcting errors in the organisational theory-in-use. An environment provided by the stimulants of interactive, problem solving-oriented and constant knowledge flows is conducive to innovativeness and a more efficient use of knowledge resources. (Salmenperä *et al.*, 1999.) Commitment is also better because teamwork is an essential tool in improving the work enjoyment of key personnel (Juvansuu *et al.*, 2000).

It is the task of managers to ensure that employees collaboratively outline the environment and produce shared interpretations of it (Ståhle – Gronroos, 2000; 1999). The hierarchical position of managers turns into roles oriented towards coaching and supporting. The old logics of management can be expressed with an acronym POEM (Plan, Organise, Execute, Measure) whereas the new version is DNA (Define, Nurture, Allocate). (Stewart, 1998a.) Managers should express the communicative attitude by their own presence. They should be easily to approach, present among employees, rather asking the right questions than providing the answers, and define targets in collaboration with employees. (Ståhle – Gröroos, 2000; 1999.) There is no doubt that
management example is the strongest of all motivators for bringing about attitude change (Stranks, 2003).

### 1.1.2 Changes in labour market structure

The essential changes in the key resources also challenge the traditional ownership structure that developed along with the Industrial Revolution. The most essential shift in the Industrial Revolution was that the employer owned the means of production and the employees’ only way to secure their income was to sell their work contribution to the employer. As a consequence of the information revolution the most important means of production (interpretation, evaluation, creativity, creating relationships) are human capital that is necessarily an individual’s assets. (Stewart, 1998b; Kasvio, 1994; Drucker, 1993.) Therefore, knowledge workers\(^2\) are not in a subordinate position to the employer, but have substantial opportunities to influence the content of their work and also the more traditional working tasks (see Figure 1).

![Diagram of traditional and new setting of working life](image)

**Figure 1** Changing power structures of working life

Such a development in the structures of working life creates a new kind of polarisation of working tasks and qualifications as the need for both high-level professional competence and narrow task-specific skills requiring routine tasks are becoming more common (Kasvio, 1994; Smith, 1991). Routine tasks easily get stuck in customary moulds and development pressures are unobserved. In one sense rigid guidelines are even the aim of quality management systems, but it is important to note that there is a risk of diminishing chances of improvement. (Salmenperä *et al.*, 1999.)

\(^2\) According to Drucker (1959), some people, including most production workers, work with physical objects whereas others work with concepts, ideas and theories. They are called knowledge workers.
Modern work life often requires the ability to make decisions and value-based judgements autonomously in increasingly complex situations and based on increasing information. Empowerment involves the relocation of power from the owners and managers of corporations to the lower-level workers (Potterfield, 1999). This gives individuals an opportunity but also the need to react faster to contacts from customers and partners. Increasing productivity demands, competition between individuals, and information and communication technologies may together create excessive dependence on work (Huhtanen, 1999). The empowered employees of a decentralised organisation need new reporting models to be able to follow the strategic planning of the entirety.

Salmenperä et al. (1999) argue that knowledge workers usually have good professional self-confidence and often have the ambition to advance in their area of expertise. Management of such personnel relies heavily on empowerment. Development discussions are an important management tool in such a setting as it provides an organised opportunity to agree on the general guidelines and goals of the organisation and develop them further according to emerging needs. As these grounds make it possible for an employee to take more responsibility over his or her own tasks, the need for daily management diminishes.

These changes also place demands on employees. Constant maintenance of one’s competence base is an increasingly important prerequisite of employability (McKenzie–Wurzburg, 1997). In a learning organisation, people continually expand their capacity to create the desired outcomes. Furthermore, organisational culture should nurture new and expansive patterns of thinking and encourage collective aspirations. (Senge, 1990.) It is characteristic of the learning organisation approach that distribution of work is consciously based on improving the personnel’s competencies. According to Senge (1990:3) “learning organizations [are] organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together”.

Generating multiple-skilled employees and supporting them as they learn are strongly linked to the daily operations of an organisation. (Sarala–Sarala, 1996.) In the learning organisation, people become able to test various mental models in each situation as it arises. In the learning organisation, such skills will be institutionalised through organisational practices that most likely will involve a facilitative organisational structure. (Flood, 1999.) Therefore, creating a learning organisation requires structures supporting active co-operation and well functioning communication. Team-based organisation, different networks, information systems and empowerment of employees are fundamental factors for this development. A learning organisation needs to become aware of the potential related to its personnel and technologies. It should develop processes so that lessons learned are implemented in future activities. As a result, a learning organisation can have the operative ability to improve its functions when it reacts to the challenges it has faced. This flexibility, which gives a competitive-edge, turns learning into a constant process in which knowledge of the means for improvements is accumulated. (Salmenperä et al., 1999.) However, organisations can only encourage their members to develop their personal competencies but it is not possible to force them and this responsibility is unavoidably on the shoulders of individuals. (Ranki, 1999.)
According to Salmenperä et al. (1999), the more work processes contain features that contribute to explaining and understanding, the more value-added and better employment potential. This would suggest that the use of information technology is beneficial to the general employment situation. When a company competes principally by means of marketing or low pricing and avoids external contacts, underdeveloped work tasks are related to the weakening employment situation. Increasing productivity cannot be based one-sidedly just on a more efficient use of traditional resources, such as capital and natural resources. Knowledge-based working tasks can be seen even statistically as an increasingly important growth factor. (Salmenperä et al., 2000).

Increased diverseness of working life reduces the amount of permanent employment and jobs become periodical and changing in content. The gaps between different jobs are also increasingly typical. Progressive companies have already reacted to these changes. New attitudes towards operations, the organisation and personnel are needed. The rate of change requires employees to school themselves, as well as temporal and financial inputs from employers. Redistribution of occupational structures and especially the speed of changes may cause most of the labour force to have problems adapting unless training for new working models and the efficient use of new working tools can be organised. (Bergström et al., 1997.)

1.1.3 Knowledge-intensive organisation and market relationships

In a knowledge-intensive organisation, the "production" does not consist of goods or services but complex non-standardised problem solving. The problem-solving process involves much information processing (not necessarily computerised) and the result is normally a report or process delivered orally or as hard copy. (Sveiby, 1992.) In the highly competitive markets, an ability to quickly launch knowledge-based products onto the markets is an important asset. Prolonged commercialisation of an innovation can be harmful as the need for it may already have passed or competitors may have gained the advantage. Thus leveraging capability is essential. (Albert – Bradley, 1997.)

Alvesson (2001), on the other hand, sees the concept of knowledge-intensive organisation as problematic because it is difficult to substantiate knowledge-intensive companies and knowledge workers as distinct, uniform categories. He argues that all work requires the processing of knowledge and the level of intensiveness is unavoidably debatable. These changes are also seen within more traditional industrial branches. Modularising is becoming increasingly important as products are divided into separated and exactly defined components and systems. Thus, the emerging possibility to distribute production to subcontractors provides huge advantages as the most efficient producers can be used and economies of scale are available to all subcontractors. Modern information technology makes it possible to organise both development and the actual production in such highly differentiated networks. Because of these changes, production has not only become more effective but also more flexible. In the long run flexibility is closely related to effectiveness. The aeroplane industry has been one of the pioneering branches in this kind of development. (Stewart, 1998.)

Organising work on a team basis has a positive linkage with competitiveness, product development and marketing. This results in increasing sales, profitability and market
share. Furthermore, quality of products or services is shown to be better and development activities more efficient. (Jurvansuu et al., 2000)

The use of information technology helps a great deal in creating innovations but at the same time it also makes imitation much easier. This feature of modern business life was discussed, for example, in *Fortune* magazine (Schrage, 2000). The article states that because of tight competition companies cannot charge customers for the innovations. Different competing innovations are so numerous that they reduce each other’s punch rather than increase it. There are three important arguments from the knowledge management perspective to discuss in connection with this problem.

Firstly, looking at the starting phase of knowledge management at Dow Chemicals the chosen approach was to condense patent variety. From this perspective overwhelming innovativeness and inability to commercialise them is not a problem as a company may sell the innovations that cannot be aligned with its strategy. On the other hand, companies can learn a great deal about innovations that do not achieve commercial success. Again, as the role of knowledge is increasing in society, this lesson can also be highly valuable.

The second and more important approach tackles the problem of copycats. As it is getting increasingly easier to imitate innovative products, companies must pay more attention to innovative processes. A final product, that is an innovation, can be copied but the process of creating it, or innovativeness, cannot (Ståhle – Hong, 2002). Therefore the imitating competitor is always lagging behind. Without constant innovativeness, a company faces the threat of becoming obsolete because customers may expect constant modifications in order to make their own processes more efficient. Furthermore, companies often need to develop a whole mindset that is sold to the customer instead of just a mere product. This may include different services, contact forums to other users or something else that increases the customer’s eagerness to be part of the network.

The third perspective points out the importance of making the distinction between generative and commercially exploitable intangibles. Discussion around innovations emphasises the creation of the future potential. This bias shifts the focus from the importance of the ability to commercialise this potential. The distinction introduced by Ahonen (2000) makes it more explicit that a company has to manage both a cycle of value creation and at the same time a cycle of commercialisation. Thus innovativeness, even though it is important, is not sufficient but a strong market orientation must also be maintained. It is the ability to create and implement commercially exploitable intangibles of the future that lie behind a company’s dynamics.

According to Kim and Maborgne (2000) there are two reasons why it has become critical to reach a large pool of customers quickly. Firstly, it has turned out that for more and more businesses volume creates more value than it used to because the nature of products is increasingly knowledge-intensive and costs in developing are much bigger than in manufacturing. Software products are a good example of this. Developing a software package may take a long time and become extremely expensive. Once the complete product is available it is rather cheap to make several copies on a CD-ROM. Secondly, companies have to reach the masses early because of network externalities.
This means that the value to a customer of a product is often closely tied to the total number of people using it; many products are an all-or-nothing proposition – either it is sold in millions or not at all. Pricing the new product or service is also dependent on the level of legal protection and on the company’s ownership of some exclusive asset, such as an expensive production plant or an established brand name.

1.2 Maintenance of work ability

Employees’ wellbeing is one of the key elements in long-term productivity and quality development in terms of sustainable development. Special attention should be paid to mental wellbeing along with physical wellbeing. (Bjurström et al., 1993.) Work environment and psychosocial factors are almost as relevant risk factors for work ability as purely biomedical factors. The atmosphere, social support and control over work tasks experienced by the employee are increasingly important as prerequisites of work ability. The development of work communities, as well as maintaining health and competencies, become increasingly important for the companies. (Huuskonen – Kalimo, 1999.)

Ilmarinen (1995; 1999a) defines work ability as a relationship between an individual’s resources and the demands of the work task. According to this definition an individual’s resources consist of health and capacity, training and competencies, relevant values and attitudes, motivation and job satisfaction. These resources are used in the work in which the work community and work environment and work-related mental and physical demands also have an influence. This context has an essential effect on an individual’s ability to use his or her resources. According to this definition work ability is a dynamic process that changes via its components as an employee ages. An individual’s work ability is further related to the personal networks (such as family and friends), organisation and the surrounding society.

There is no official definition of work ability stated in legislation (Ilmarinen, 1995). The definitions of work ability depend on the perspective. If work ability is evaluated to explore the grounds for social insurance-based benefits, the definition focuses on deficiencies of health and their medical validation. On the other hand, from a company’s point of view it is the employee’s ability to perform work tasks by professional competencies, health-related prerequisites and mastery of the task. (Anttonen et al., 1998.) It is important to see that health per se does not define work ability, but it is a sum of physical, mental and social capacities. It is also dependent on the requirements of the work task. Work disability can be generated even without changes in health. Changes in threats, strain or demands of work can lead to a clash between work ability and the requirements of work. Organisational culture can affect the inability to work as the discrimination against handicapped employees pushes them out of working life. On the other hand, the work community that aims at developing resources also activates those with a handicap and participation in working life is longer. Uncertainty of employment and productivity, quality, learning and other demands are a burden for an already handicapped person. (Rantanen, 1999.)

On the other hand, the concept of work ability has been criticised as not existing theoretically as an independent “entity” or unambiguous, measurable and concrete
phenomenon, but there are different conceptions about it varying according to time and context. The medical profession sees work ability as health, or more specifically absence of illnesses. The view of Ilmarinen presented above represents a balanced model conceptualisation according to which work ability is a balance between an individual’s resources and the requirements of work. This means evaluating whether an individual’s resources are sufficient for undertaking certain work tasks. This is because occupational health care or rehabilitation has only a limited influence on the requirements of work. Integrated conceptualisation takes work ability as a systemic feature consisting of individual, employer, work community and work environment. Furthermore, this system is related to time, space and activities. According to the integrated conception problems of work ability should be seen as malfunctions of this system and the maintenance of work ability as the development of it. Even though the balance model conception is predominant in the scientific literature on work ability, the every day conceptions of the experts are more all-embracing than those in the literature. (Mäkitalo et al., 1995.)

The occupational health care advisory board of the Ministry of Social Affairs and Health has defined the maintenance of work ability so as to include all activities by which an employer, employees and co-operation organisations in the work place together aim at improving and supporting work ability and the capacity of each individual participating in work life at all phases of the career. (The occupational health care advisory board, 1992; Ref. Matikainen 1995.) Prevention consists of proactive activities aimed at securing an individual’s work ability and capacity as well as possible. Improvement of the work ability is focused on an employee or work community already threatened by decreasing work ability. The aim is to prevent the creation of disparity between demands and resources. On the individual level it is important to define threats and become active as early as possible. The atmosphere and functionality of a work community should be considered before problems occur. (Matikainen, 1995.)

The starting point for the Finnish maintenance of work ability approach can be identified in a memorandum on the maintenance of work ability in work places that was created by central labour unions and the employer’s confederation in 1989. This resolution was written into the law on occupational health in 1991. The new compensation system for occupational health activities in 1995 included maintenance of work ability in those activities covered. (Bergström et al., 1997.) Instead of preventing illness, the maintenance of work ability aims at supporting health and the individual’s work ability and general capacity. It has a more holistic approach to work life as it focuses increasingly on improving mental and social capacity, competencies and professional skills. (Rantanen, 1999.) It has been characteristic of MWA from the beginning that it is addressed to all employees and there are no restrictions with regard to either age or occupation (Ministry of Labour, 1996).

The maintenance of work ability includes activities that aim at improved physical and mental condition, adopting healthier ways of life, development of professional skills and adaptation to changes, as well as supporting job satisfaction and motivation by feedback and rewards. (Aro, 1998.) Collaboration between members of a work community and also between different work organisations is strongly emphasised. An individual is an active doer and participator instead of mere object of activities in this framework.
Everyone should take responsibility for his or her own work ability. This means adopting new work roles and the courage to build new ways of collaboration. Successful maintenance of the work ability is undertaken by a clearly defined programme with goals and time limits. The goals should be in proportion to an organisation’s other activities. (Rissa, 1996.) Introducing such a programme calls for managerial decisions and a definite commitment. Otherwise the activities are inadequate and the chances of success are poor. A maintenance of work ability -programme can be included as a part of a company’s quality system. Thus an MWA programme would support the organisation’s attainment of its strategic goals and assist in the understanding of the development of personnel resources as a whole because it produces reliable information about the personnel’s actions, competencies, wellbeing and job satisfaction. An organisation can get a comprehensive understanding when linking personnel indicators to other monitoring systems. (Louhevaara, 1999; Aro, 1998.)

Maintenance of work ability programmes are actually a manifestation of a deeper underlying process. The maintenance of work ability should be linked to an organisation’s everyday activities because attitudes and values are important targets along with knowledge and competencies. The biggest hindrances often lie in organisational culture and people’s motives. The process gives these development activities continuance and systematic goal setting. (Rissa, 1996.) Implementing standard development processes without relating them to the organisation’s reality and cultural characteristics is usually ineffective. Cultural assumptions and shared emotions form the shape and content of development activities. Interpretations guide the generation of commitment, disinterest or disagreement. Therefore it is important to reflect organisational culture in implementing development activities. (Länsisalmi et al., 1998.) New organisation development models should be analysed critically to identify their essential characteristics. Based on this analysis new models should be linked to previous development activities because recurrent changes in models and concepts do not motivate anyone to persistent and consistent development of their work. (Sarala – Sarala, 1996.)

Long-lasting and uncontrolled work-related stress can lead to burnout that is characterised by chronic fatigue from which one does not recover by normal rest, increased cynicism and weakened professional self-respect. Maintenance of work ability and other development activities are essential in order to prevent it. The work demands and an individual’s resources have to be balanced. Increasing job control and maintaining professional skills and development have been shown to be important and efficient approaches. (Huuskonen – Kalimo, 1999.) While work ability evolves in relation to work demands, knowledge –work, in particular, gives an employee good opportunities for shaping work and its demands. (Huuhhtanen, 1999).

Trust in the work life is the employees’ commitment to the employer’s goals but also the employer’s commitment to the employees’ goals and the improvement of the labour market position. Mutual trust is the key for approaching profound usage of the innovation capability. As the knowledge intensiveness and innovation dependency of

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3 Trust is the actor's expectation of the other party's competence, goodwill and behaviour (Blomqvist – Stähle 2000).
the companies increases, work organisations need increasingly information on how personnel resources are evolving in this sense. (Salmenperä et al., 2000.) Traditional technical planning competence and non-verbal skills are no longer as important. Verbal and symbolic interaction skills are increasingly important as different networks and contacts should be used quicker when needed. Good connectivity helps an individual meet the uncertain future. (Huuhtanen, 1999.) Motivation and willingness to work are key elements for work ability (Vuori, 1999).

There has been much research on work ability risk factors in Finland, but much less in international literature (Matikainen, 1998). The disability to work is a barely defined, relative concept based on biomedical, behaviour scientific and social political matters. Therefore the research should be highly multidisciplinary. At the same time professional structures are rapidly changing and the content of similar tasks can be totally different from what they were a decade earlier. An individual’s adaptation can be very difficult or even impeded. To meet these new requirements the scope of the research must be broadened from individually-oriented biomedical research to analyse the causes behind disability in a specific work context and its requirements. For example, changes in the way work is organised may alter the mental and social requirements in a way that differs strongly from the traditional tight management style. The research in this field is quite new as it was still in its early phases during the mid 1990s. However, the four dimensions of MWA had been already defined. (Rantanen, 1995.)

In international literature, the interest is generally focused on occupational health and safety promotion in the workplace. It could be regarded as a modern corporate strategy, which aims at preventing ill health at work (including work-related diseases, accidents, injuries, occupational diseases and stress) and enhancing the health-promoting potential and wellbeing of the workforce. According to the work site health promotion framework, workers lifestyles, including diet, exercise, smoking and drinking habits, are also seen as central. Therefore, health education designed to promote good lifestyles and discourage those detrimental to health should be introduced into the workplace as part of the occupational health and safety programme of activities. Ageing of the employees is also seen to have considerable effects on health. (Wegman, 2004; Alli, 2001; Wilkinson, 2000.)

It is characteristic of the MWA framework that it includes activities traditionally included in occupational health care, as well as developmental actions, which are preferably carried out as a part of an organisation’s ‘normal’ functions and preventive actions mobilised only by some sign of alarm (Kalimo – Toppinen, 1999). This adoption of a broader scope in activities shifts the emphasis from preventing traditional health hazards towards a more comprehensive promotion of work-related wellbeing. In an international comparison, Finland is in a group of countries that pay much attention to preventing work stress and that consider work stress as a relevant health and safety issue (Kompier – Cooper, 1999).

One of the most used tools for estimating an employee’s work ability in Finland is the Work Ability Index. According to the theory that underlies this tool, work ability is a phenomenon based on judgements from many sources. The Work Ability Index is designed for occupational health care and can be used to evaluate how well an employee
can perform his or her work tasks. The Index takes into account both the physical and mental demands of work and also the employee’s health and resources. (Tuomi et al., 1997.)

Empirical studies have shown that good organisation supporting the personnel’s resources and support by the supervisor improve the employees’ sense of control over work and conceptions of developing possibilities. Good organisation, leadership and moderate work requirements correlate with good work ability and high mental wellbeing. Excessive work pace, monotonous tasks and unnecessary work rules are negative to wellbeing. Personnel development should be linked to comprehensive organisational development. Traditionally MWA has been characterised by an emphasis on physical exercise and individuality. However, empirical results show that comprehensive improvement and support of wellbeing and professional competencies are more important because they help to create a healthy organisation with natural collaboration. (Jurvansuu et al., 2000b.) A healthy organization is one that meets its mission and simultaneously enables individuals to learn, grow and develop (Dive, 2004).

Launis et al. (1998) analysed employees’ conceptions of their work ability, strengths, influencing factors and MWA plans in four organisations. The results show that work ability was mainly understood as an employee’s health and individual characteristics. Plans for maintaining work ability were heavily biased by these characteristics, for example, by physical fitness activities or individual rehabilitation. The problems of work ability arose mostly from continuous growth, ambiguity of work tasks, unclear division of labour, inadequate methods, lack of shared planning and undermining the personnel. The disparity between problems observed and activities undertaken was incisive. The plans did not generally meet the observed challenges of the work changes. This is seen to be due to the historical background of the work ability concept. In this setting it is essentially related to evaluating an individual’s disability and, therefore, there has been a distinct emphasis on a medical and expert-oriented approach and other dimensions, that are seen to be more relevant in current work life, are neglected.

Over 60 % of Finns use new information and communication technologies in their work. Changes in content and methods of working imply heavy development challenges to professional qualifications, as well as management practices. These features have been discussed above in this overarching essay of the thesis. Over half report that the excessive work pace causes stress and hinders work performance. (Rantanen, 1998.) Distractions are caused in every-day work by constant changes in the technological work environment and malfunctioning of the computer systems. If such distractions last long, they can lead to excessive pressures and stress reactions. Optimising the pace of changes and controlling the speed are some of the most essential challenges in the development of work tasks and a work community. (Huuhtanen, 1999.) Improving the quality of the psychic work environment for managing a fast pace and stress combined with psycho-physiologically suitable working hours will be an essential task for the maintenance of work ability activities in future. At the same time 30 – 50 % of the Finnish labour force is still exposed to physical-chemical or mechanical threats and even one third does physical work. Therefore, the more traditional approaches also cannot be neglected. (Rantanen, 1998.)
The increasing need for innovativeness, that was discussed earlier, sets up new kind of demands on working life. It is common for all innovation supporting procedures that they enhance dialogue. In the core of this dialogue are questions and answers oriented interaction and the culture of challenging ideas. This new kind of tolerance for contradictions and systemic challenging of the ideas sets heavy demands on the functioning of the work community. The more complex the problem is, the more relevant becomes experience, knowledge base, endurance and interaction skills. Socially oriented person or organisation can organise the required knowledge creation according to strategic goal. (Salmenperä et al., 2000.) Deficiencies in professional skills can rapidly turn into a serious problem in work life. This is also a health related threat as it creates a burden and increases work related stress. (Ilmarinen, 1999b.)

When the work atmosphere is good in an organisation, knowledge sharing is very open. The relationships between people are based on mutual liking, trust and respect. Encouragement is strong and managers are interested in people’s work tasks and provide much feedback. A good atmosphere supports collective problem-solving at the work place. The tasks are well organised and mutual helpfulness is active. A good atmosphere helps employees perform their tasks whereas a bad one weakens it. Links between stress and job satisfaction have been clearly shown. (Juuti, 1998.) The importance of trust, openness and courage that constitute care is also characterised as an enabler of knowledge creation (von Krogh et al., 2001; von Krogh, 1998).

Increased diverseness of working life reduces the number of permanent employments and they become part-time and change jobs frequently. This development causes a paradox as less employment leads to uncertainty in employees and this is harmful for innovativeness. The organisational culture, seeing employee issues as secondary, causes mental pressure. Mental pressure has increased more often during the 1990s than physical workload (Huhtanen, 1999).

1.2.1 Ageing work force

The maintenance of work ability has been seen as most topical for elderly workers because combining capacity with work demands is increasingly difficult for ageing workers. The physical workload does not change even though respiration, bloodstream and musculo-skeletal capacity decrease depending on physical activity. In tasks requiring mental work psychological requirements and qualitative difficultness increase while accuracy and speed of perception decrease. To meet these challenges the excessive increase of demands should be prevented by collaborative task planning, and replacing psychomotor requirements by cognitive problem-solving skills, for example. (Ilmarinen, 1995.) The trans-European trend of an ageing labour force is especially rapid in Finland. This is due to post-war baby-boom age groups. (Rantanen, 1998; 1999.) Finnish men aged 50 – 54 participate in working life below the European Union average. Furthermore, this difference even increases in older age groups. At the same time Finnish women participate in working life above average especially in age groups 50-54 years and 55-59 years. The considerable participation of women in working life results in the average graph of elderly Finnish workers not deviating significantly from the EU average. (Huuskonen – Kalimo, 1999; Ilmarinen, 1999a; Ministry of Labour,
An elderly employee has mature ways of thinking and is usually more willing to take responsibilities than younger colleagues (Bergström et al., 1997).

As the Finnish labour force is ageing so quickly, the importance of physical activities is also increasing. A 60-year old person exercising regularly may have a capacity and work ability at the same level as an inactive 40-year old. Therefore, physical activeness is also in the interest of the employer. (Ilmarinen, 1998.) Health-related deficiencies in work ability start accumulating around 45 to 50 years of age. These changes influence later employment. The sustainable improvement of ageing people’s capabilities requires the comprehensive maintenance of work ability early on. (Ministry of Labour, 1996.) Physical exercise is an important factor in improving work ability because it not only has physical effects but also increases mental resources. (Ilmarinen, 1995.) It has been shown that well-designed MWA can reduce sick leave and early retirement. At the same time productiveness has improved. The financial benefit gained by development like this can be substantial. (Ministry of Labour, 1996.)

According to Matikainen (1995) maintenance of work ability is beneficiary for an organisation, as well as an individual employee, because increased wellbeing and capacity also contribute to more enjoyable retirement (see Figure 2).

**Figure 2 The Benefits of Maintenance of Work Ability (Matikainen, 1995)**

### 1.2.2 Financial and economic significance of maintenance of work ability

Work ability forms a basis for an individual’s employability. Employability can be supported by different supportive and service systems, changes in work and pension legislation and by affecting prevailing values and attitudes in the society. (Ilmarinen, 1999b.) It is true that chronic illnesses increase the need for care. Work ability gradually decreases along with general physical capacity. Nevertheless, the retirement policies
aimed at removing elderly employees from work life reflect the neglecting of experienced, settled and more mature thinking and the ability to take responsibility that the older employees possess. These characteristics are invaluable in managing the constant information overflow that is so usual in current work life. (Rantanen, 1999.)

Occupational health and safety practices are relevant both in directly preventing costs and in supporting a company’s intellectual capital. Accidents and work-related illnesses have dramatic economical implications at a company level. Furthermore, they affect the employees’ wellbeing and thus the innovation environment of the whole company. (Salmenperä et al., 2000.) It has been estimated that in Finland sick leave alone cost companies two billion euros annually. Accident-related absences account for 0.5 billion euros of this amount. (Aro, 1998.)

Maintenance of work ability has significant national economic consequences. It has been estimated that sickness and work-related accidents add up to 18.5 billion euros, which is one fifth of the Finnish GNP. The costs consist of institutional care, treatment of outpatients, medication, sick leave and most importantly early retirement and death. It is quite interesting to note that while public health indicators show continuous improvement, the number of disability pensions and also the willingness to leave working life have increased. Demographic statistics from 1990 showed that 40 % of the labour force over 50 years old had illnesses slightly restricting work ability and 20 % of them illnesses that restricted their ability considerably. Statistics have also shown that long-term illnesses increase significantly after 45 years of age. (Anttonen et al., 1998.) One significant feature behind this development is the changes in social security systems. Retaining or losing the ability to work is very much an individual issue. The system of occupational retirement ages did not meet the needs of reality. Therefore, it was necessary to move to individually flexible policies, which included individual early retirement, part-time retirement and earlier old age pension. (Puro, 1995.) The Finnish pension system during the 1990s has offered nearly a dozen different alternatives for early retirement. (Ilmarinen, 1999a.)

Besides the effects at a national economic level, maintenance of work ability also affects the business of a company in three ways. Direct commercial effects relate to improved health and atmosphere of the work community. Reduced sick leave is an important result as it has been estimated that losses for companies add up to 2 billion euros annually in Finland. Reduced sick leave and an improved work atmosphere improve productiveness. Furthermore, temporary labour is more expensive as work has to be done in overtime or subcontracted. Improvements in the work environment reduce the risk of accidents that cause a loss of work input as well as other costs, such as damaged tools and materials. (Ahonen, 1995.) The usual estimation of lost production due to sick leave is 1.5 times the hourly wage cost caused by the absence. In a competitive situation it is often easier to improve results by reducing the disadvantages than increasing the sales. (Rissa, 1996.)

Costs that are related to company size are indirect but they may have a considerable effect. Such costs are usually difficult to take into account in decision-making. (Ahonen, 1995.) In the Finnish pension system companies pay their share of disability pensions according to the number of personnel. Companies with less than fifty employees have no excess share at all. The percentage of excess share increases linearly until companies
with over eight hundred employees have to cover the entire cost of a disability pension (see Figure 3). This is usually covered as a one-time payment to the authorities who then pay the pension over the years. Therefore the costs may have a considerable effect even on a larger company’s balance sheet in any given year. The system was modified in 1996 as the size of companies liable to excess was lowered from three hundred to fifty employees. (Ahonen, 1995.) Another modification introduced in 2002 lowered the limit of full coverage from 1,000 to 800 employees (Haunia, 2003; Tuomikoski – Kilponen, 2003).

![Figure 3 Company excess of disability pension according to the company size](image)

**Figure 3 Company excess of disability pension according to the company size**

Thirdly, costs on the economic level also have an indirect effect on companies. Most of the national economic costs are not paid directly by companies, but they do constitute a burden on the national economy and the public sector. These costs are reflected in the personnel indirect costs, as well as taxation, and thus have an indirect effect on the company’s cost structure as well. These multifaceted benefits contribute to a situation where the maintenance of work ability forms a starting point and facilitator for a positive cycle. Thus the maintenance of work ability has a significant role in the development of Finnish economic life. (Ahonen, 1995.)

The financial implications of MWA at a company level are difficult to estimate because they are influenced by a multitude of factors. These include other internal actions, changes in the operational environment of a company and opportunities provided by taxation and bookkeeping legislation to modify the accounting results. (Kaleva, 1998.) This also reflects on research, because the majority of research on the economic impacts of MWA has focused on national economics (Ahonen *et al.*, 2001; 2002). However, it has been shown that investments in MWA are usually quickly regained by reduced personnel costs and increased productivity (Rissa, 1996). It has also been shown that an organisation’s success also has a positive influence on the wellbeing of the employees. Work ability is lower in organisations that perform poorly. Personnel wellbeing, organisational health and an organisation’s success seem to intertwine in a complex way. This connection is affected by the organisation’s size, business area and business environment. (Jurvansuu *et al.*, 2000a.)
2 THE RESEARCH PROBLEM

As can be seen from the introduction above, in both the intellectual capital and maintenance of work ability framework there is a need for systematic research on the theoretical linkages between these two superficially quite different approaches. This study aims at opening some new insight onto these linkages by the general research question:

“What is the relationship between intellectual capital and the maintenance of work ability?”

As has been discussed above, the increasing use of information and communication technology is central to the changes that have taken place in business life. Kasvi (2003) discusses the influence of information technology systems that facilitate knowledge sharing in relation to employees’ wellbeing. According to his view, the implementation of information systems will hopefully also ease the negative mental load but this can actually have quite the opposite effect. For example, employees can experience stress due to difficulty in using the system. The requirements of a computer-aided documentation system in terms of forced rhythm and detailed execution reduce the opportunity to control the work requirements. As it is further discussed in the study, sufficient opportunities for controlling tasks are one dimension in Karasek and Theorrell’s (1990) job stress model. On the other hand, the introduction of new tools also alters the work requirements, which is the second dimension of this stress model. Therefore the combination of increased job requirements and simultaneously decreased the opportunities to control the work result in a situation that is labelled stressful work which is characterised by mental load and increased risk of physical illness.

Haines and Bédard (2001) scrutinised the effects of early retirement on a work community’s capacity to socially create new knowledge. This study shows that early retirement influences several dimensions as the roles and task descriptions in the network need to be altered, so settled collaboration and interaction relationships, which enhance feelings of companionship and trust, are broken, and there are communication problems because of differences in job-related terminology, for example. They suggest that job burnout might be linked with shortcomings in knowledge creation. According to their view this linkage is an interesting area for future research. The discussion around job-related burnout was very lively in Finland during the late 1990s and early 2000s. As it has been stated above, the maintenance of work ability framework has been the most important approach to tackling these problems in the Finnish occupational health policy.

Even though the role of human capital is seen to be central in the IC literature, there are few studies discussing the relationship between intellectual capital and work-related wellbeing. Brooking (1995) mentions employees’ health as one indicator of intellectual capital without further elaboration. Edvinsson (2002) also discusses the threat of stress to innovativeness. However, the literature review shows that there have not been systematic research designs focusing on the relationship between intellectual capital and employees’ wellbeing.
On the other hand, the business economic implications of the maintenance of work ability have traditionally been analysed from the sick leave and productivity points of view (Oxenburgh, 2000; 1997; Johanson, 1997). This approach focuses on the cost savings that are generated by reducing sick leave and, on the other hand, improvements in an organisation’s productivity. However, no specific framework is provided for evaluating changes in the productivity so it is only possible to estimate the consequences on this level. As discussed above, the increasing knowledge intensiveness of the business world also alters the concept of productivity, as products can be more intangible by their nature. Salmenperä et al. (2000) do mention employees’ wellbeing in relation to intellectual capital, but this statement is not elaborated on further. Therefore, new conceptualisations are also needed for discussing the economic significance of MWA.

The next section discusses the methodology and methods that have helped in answering the above-mentioned research question.
3 METHODOLOGY AND METHODS OF THE STUDY

According to Raunio (1999) the concept of methodology easily creates confusion because of its multiple meanings. Thus it is seen as meaningful to reserve the concept of methodology to describe the scientific ideology and to use methods for the actual means of acquiring new information during the research process. Following this distinction the following sub-sections discuss the actual methods used for analysing the data in this study and the methodological strategy on a more general level. Methods scrutinise the rules according to which these observations are further modified and interpreted so that they can be evaluated as clues for solving the research problem. The methodological strategy outlines the logic of answering the research question by stating how observations are generated. (Mason, 2002; Raunio, 1999; Alasuutari, 1994).

3.1 Methods employed in this study

The aim of this study is to analyse the relationship between intellectual capital and maintenance of work ability. The nature of the problem is both conceptual and empirical. It is conceptual as the intention is to ascertain relevant conceptual relations between these two phenomena. It is empirical as the aim is to examine how these two phenomena are in practice treated by the people involved. The study began from the empirical end by interviewing experts in both fields involved, based on the pre-understanding of the phenomena. To capture the conceptual dimension of the problem concepts occurring in the interviews were elaborated upon. A case study of a number of companies was included to demonstrate certain crucial aspects of Intellectual Capital. The order of the separate sections of the current study is not the same as the order of the actual study.

The main research method of this study follows the logic of computer-supported interpretive textual analysis consisting of the use of interrelated methods of theoretical sampling, software supported text analysis, expansion analysis and producing text-based descriptive statistics. The inclusion of ‘quasi-statistics’ is a debated theme in interpretative qualitative research and thus it can be seen as provisional in this setting. (Gephart, 1997; Kelle, 1995). Because of its unclear position as an element of this approach, the use of descriptive statistics was not included in this study.

Even though the aim of this study was to recover theory-based themes in the data, the research method of this study does resemble grounded theory if compared to ethnography, phenomenology or discourse analysis, for example. Even though the two groups of experts are taken as the sources of information, these are not seen as unified groups, which the selected interviewees would represent. In other words, there is no group as such central to the interests of this study that would provide a target for ethnographic research (Goulding, 2005; Daymon – Holloway, 2002). With respect to phenomenology this study is not aimed at scrutinising the details of an experience with regard to its objects (Goulding, 2005). When it comes to discourse analysis, the interest of this study was not to elaborate on the differences in the discourses (Daymon – Holloway, 2002) the interviewees with various backgrounds use to describe the central phenomena.
For the purposes of this study, the two data sets were both analysed as a whole using a specific theoretical framework. A theoretical framework can provide a qualitative researcher with a tool that enables the creation of interpretations and represents these interpretations in a scientific form. On the other hand, theoretical conclusions may be a goal of deducting common features based on single observations. (Eskola – Suoranta, 1998.)

The software supported text analysis phase is scrutinised in more detail because this approach has multiple implications both in terms of coding and the use of computer software. Qualitative analysis begins with dividing the data into smaller entities. According to Raunio (1999) this thematic division can be seen as an essential starting point for all textual qualitative research. Coding or categorical indexing is a commonly used alternative for doing this. Categorical indexing is a process in which the researcher assigns certain signs to chosen text passages. Categorical indexing is a consistent system for indexing the whole data as uniform categories are applied to it. However, data retrieval applying a specific category is yet to be treated as unfinished resource. It is only raw material for conducting further analysis. (Daymon – Holloway, 2002; Mason, 2002; Eskola – Suoranta 1998.)

Categorical indexing is a suitable approach for analysing the data of this study because the data is predominantly text based. The conversations in the interviews have all been transcribed. Further strengths of categorical indexing are the ability to provide a systematic overview of the data in terms of coverage and scope. The researcher is able to locate and retrieve issues, topics examples and themes otherwise not clearly available in the data (Mason, 2002).

Several practical issues can be laid out with reference to the notion of ‘coding’. The data can be considered true descriptions of the reality and that it is possible to get truthful information by using different methods. This approach is based on the assumption that speech can be used as a tool to learn about existing facts. The kind of stance a researcher should take on his or her data is dependent on the researcher’s interests and goals. A more relativistic standpoint can also be taken if it is a meaningful approach to the research problem at hand. (Silverman, 2000; Eskola – Suoranta, 1998; Fielding – Lee, 1998; Alasuutari, 1994.) Some traditions treat coding as a necessary and self-evident ingredient of, even a synonym for, ‘analysis. However, synthesis is not a single concluding act, but a continuous activity of assessing data and articulating concepts (Jensen, 2002).

Qualitative researchers tend to conceive of their studies as an iterative or repeated research process, which allows the use of theoretical concepts and analytical procedures for a wide variety of empirical domains. What distinguishes qualitative research, in particular, is that key concepts and other minimal constituents are defined and redefined as part of the research process itself. (Jensen, 2002.) The process of categorising data means constant elaboration of the categories until the result can be seen as an answer to the specific research questions. However, even these can be seen as open to revision (Ely et al., 1991).

The coding process of this study began as a text-based pursuit of relevant themes and it can be said that the first phases of coding actually followed the grounded theory
approach quite rigorously. This iterative scrutiny of the data was extremely useful because it helped familiarise the researcher with the data. However, for the purposes of answering the actual research questions the use of theory-based categorisations was found most useful. Therefore, in essay three the analysis of intellectual capital experts was finally conducted from the maintenance of work ability point of view, namely competence, work environment, work community and health. Accordingly, the maintenance of work ability expert interview data was analysed in essay four from the human capital, internal structures and external structures points of view, which constitute the intellectual capital framework.

Theoretical constructions provide a framework for understanding and explaining specific observations and they are at the core of the study. Theory-based hypothetical perspectives act as a starting point for empirical analysis and they are not tested in the manner of hypothetical-deductive orientation. The concepts of theoretical framework and empirical data are constantly reflected on each other in order to maintain the validity of the research. (Raunio, 1999.) On the other hand, Silverman (1998) argues that coding of the data cannot rely solely on the reproduction of the categories used by the participants because this leads to *ad hoc* labels. Instead, qualitative researchers should aim at redefining their data within a well-articulated analytical scheme. At best, a theory is understood as a set of explanatory concepts. Thus the use of theoretical concepts as the keywords of coding can be taken as well motivated.

In essay five the point of departure for the analysis results from essay four. This scrutiny showed that the human capital and internal structures points of view are the most central angles for the purposes of the organisation studies. This finding is further elaborated in essay five which thus has its codes more grounded in the data. A similar approach actually also applies to the analysis conducted in essay two. The leading idea in grounded theory methodology is that the “researcher should go to the field with empty hands” (see, for example, Glaser and Strauss, 1971). This means that the researcher makes only tentative literature examination before collecting his or her data (Goulding, 2002). A loose conceptual outline of the topic is helpful in order to focus the study and collect the data in a meaningful way instead of getting a disorganised collection of observations more or less related to the topic. (Raunio, 1999.) In this study, the literature overview described above in the introduction of this overarching essay was conducted to fulfil this requirement. Because of its tentative nature, it can be challenged with the viewpoints discussed in the limitations of the study. However, it is aimed at showing the reader the pre-understanding that was the starting point for entering the field study phase of the research. Essay one is purely theoretical and thus considerations on methods to undertake empirical scrutiny of the data are not relevant.

Coding is always a construction of the researcher. Thus instead of speaking about qualitative analysis programs we should perhaps refer to programs that help the researcher to organise his data, and forget the exaggerated claim of analysis. In most of the cases the program does no analysis at all, so it is still the task of a researcher. Since the computer is incapable of performing semantic considerations, it cannot perform the codification. The best it can do is to categorise different groups of symbols (e.g. a sentence or a paragraph that contains a specific word), it is the researcher that categorises meaning. (Wilkinson, 2000; Eskola – Suoranta, 1998.) However, computer-aided qualitative data analysis does considerably facilitate and enhance indexing and
retrieval. Because they can provide invaluable assistance to any qualitative researcher, it is important to take advantage of them (Mason, 2002).

There is a danger that computer-aided qualitative data analysis may direct a qualitative researcher towards the logic of variable analysis. This means that because it is easy the researcher begins treating the categories used for analysis as a set of variables that are compared to each other in the search of causal relationships. For example, studying numerical information about the findings of the analysis, like the commonness of certain categories, in relation to the background of the interviewees leads the researcher astray from the logic of qualitative researching. (Mason, 2002.)

This research is conducted using the software Atlas/TI-qualitative workbench, but only a very few of its options have been used. The role of the program has been to help find and print coded text passages. Theory building tools have not been used, for example, in order to avoid the logic of variable analysis. It could be stated that the Atlas/TI-program has been used as an advanced marker pen. I was able to replace different pen colours by marking each text passage with the intended code and data retrieval was easier as I was able to produce a printed list of each code by a couple of mouse clicks. A more traditional way of achieving this would have been to simply copy-paste each passage into a new file that was saved by the code name. Using the Atlas/Ti-program I have been able to avoid unnecessary routine tasks and the coding has also been more accurate. Thus, I claim not to have been entrapped by the features of the program, but rather I have used it in the most practical way to perform this study.

The current trend in qualitative research does not accept even a thorough description of the data per se as sufficient for the purpose of the research. These first level observations need to be interpreted against the explicated theoretical frame of reference in order to advance from this descriptive material to building theoretical concepts and theory-based interpretation of the data. (Silverman, 1998; Raunio, 1999; Alasuutari, 1994.) Therefore, when doing qualitative research, mere mechanical organising and superficial description creates only conceptual clarifications. Interpretations of those being researched represent first level interpretation. Reflective theoretical consideration is an essential part of all scientific activities. It is the distinctive feature that makes scientific conclusions different from natural attitudes and common understanding. The creation of the second level interpretations is the very idea, and at the same time the difficulty, of qualitative research. (Eskola – Suoranta, 1998.) Following the work by Gephart (1997) this phase is called expansion analysis.

Expansion analysis involves writing an interpretation of the data segments to show how theoretical concepts operate in the data displays. The expansion analysis links the categories and themes used to organise and retrieve data to the substantive features of the data and to the theoretical concepts used to interpret the data. The use of software makes it easier to comprehensively search for the most representative textual quotes to highlight the interpretation in the context of the data. (Gephart, 1997.)

In evaluating the results of qualitative research it is important to keep in mind that generalising findings to a certain basic set is relevant in terms of a certain science ideal. For qualitative research the only interesting criterion is how well qualified the given explanation is seen to answer the research question. Most essential is the aim of the
research to explain the phenomenon, to make it understandable. Revealing or proving the existence of this phenomenon is not needed but the essence is to create an explanatory model that applies as comprehensively as possible to the data it is derived from. The validity of the results, that is, the variables actually measure what they are supposed to, is never simply a technical matter that can be evaluated with simple calculations but the accuracy of the information must be evaluated in relation to the questions at hand. (Alasuutari, 1994.) According to Silverman (1998) validity relates to the extent that research allows generalised observations to be made. The models that are presented in the following research articles have been created following these principles. In terms of reliability, audio-recordings and their transcripts using standard conventions meet the demand of documenting the data collection procedures (Silverman, 1998). These phases have been undertaken for all the interviews in the data of this study. The principles of further data analysis have been presented in this section.

3.2 Methodological meta-considerations

The scientific community places increasing demands on researchers to reflect on their ideas on reality, humans and understanding of the nature of object of the research, and therefore different research methodologies. The aim of these ontological and epistemological considerations is to reveal prevailing presumptions because these viewpoints define the nature of the data applicable for the setting and also the variety of applicable methods. (Mason, 2002; Eskola – Suoranta, 1998; Alasuutari, 1994.) This means that methodology is understood in its philosophical sense as an overall strategy of conceptualising and conducting an inquiry, and constructing scientific knowledge (Cecez-Kecmanovic, 2001).

The ontological position involves asking what the researcher sees as the very nature and essence of things in the social world. The epistemological position is closely related to the ontology, because it focuses on the presumptions about how data can be generated in terms of this ontological setting, that is, whether or not social phenomena can be known and how knowledge can be demonstrated. (Mason, 2002.) The ontological position of this study is to take the phenomena that are being researched, namely intellectual capital and maintenance of workability, as social structures or constructions, which are constantly shaped by a variety of actors working in these fields. Therefore knowledge about these phenomena, that is, my epistemological standpoint, is available through creating insights by interviewing actors in these fields.

According to the traditional view quantitative methods are able to provide superficial, but at the same time reliable, knowledge, whereas qualitative methods reach deep-rooted insights, which are, on the other hand, difficult to generalise beyond the specific research setting. Thus qualitative methods are seen as an applicable approach in preliminary research that aims at building hypotheses. On the other hand, it can be argued that qualitative research produces products, categorisations, conceptual tools and explanations for different phenomena. Those conducting survey research transfer these categorisations as such to response alternatives and use the explanations provided to interpret the distributions and correlations of their statistical data. Therefore qualitative research would by no means be subordinate in relation to its quantitative counterpart. (Alasuutari, 1994.) Quantitative research aims at testing a theory that is applied as
universally as possible to different data and topics. Qualitative research, on the other hand, aims at building a topic specific theory built upon certain empirical data. In this process a theory is developed and focused on constantly as the analysis proceeds. (Raunio, 1997.) On the other hand, many authors have emphasised that the differences between these two approaches are not that distant in the methodological sense, but that they have different approaches to the style of reasoning. Combining the two approaches, which is also called triangulation, results in better outcomes than a single approach would be able to provide (Daymon – Holloway, 2002; Brewerton – Millward, 2001; King, 1994.) It is even argued that assumptions and beliefs within a theory stipulating the hypotheses and the broader research paradigm in which the theory is embedded require qualitative judgement. Therefore, these two approaches cannot be separated from one another. (Howe, 2003; Clert et al., 2001.)

The choice between qualitative and quantitative methods can also be approached from the perspective of research questions. “What” and “how” questions are seen as typical of qualitative research whereas “how much” and “why” require quantitative methods (Töttö, 1997; Lindlof, 1995). The aim of qualitative data analysis is to create clarity and thus new knowledge on the focus of the research as incoherent data is moulded into clear and meaningful findings. The role of the data is to help the researcher in one way or another to construct a conceptual understanding of the phenomenon that is being researched. The data is used as a basis for theoretically consistent perspectives. (Eskola – Suoranta, 1998.)

The general aim of this study is to generate arguments about how two social phenomena, namely intellectual capital and the maintenance of work ability, compare. This goal refines the research approach to the mechanism of comparison. According to Mason (2002) qualitative research can be particularly useful for such an approach because its sensitivity to the context provides opportunities to build fully meaningful points of comparison.

All of these considerations show different angles as to why the qualitative approach is suitable for the purposes of this study. Conceptualising the similarities and differences of IC and MWA can be seen as an attempt to theorise about the links between these approaches. Furthermore, the exact verbal form of the research question presented above also points towards employing qualitative methods because, as it was stated above, the question ‘what’ is related to a qualitative approach. To sum up, qualitative research is best suited to the aim of comparing IC and MWA.

The interviews that were conducted to gather data also act as an arena enabling the creation of new meanings in relation to these topics. Following the definitions by Mason (2002) it is not possible to collect the data in terms of these ontological and epistemological presumptions but it has to be generated in collaboration with the interviewees of the study.

The focus of sampling the interviewees was based on the evaluation of expertise among the potential interviewees. This approach is often called theoretical sampling (Daymon - Holloway, 2002; Mason, 2002; Gephart, 1997). Naturally the practical and resource based (Mason, 2002) aspects also influenced the selection process. For example, some of the foreign interviewees were met whilst at different meetings whereas specific trips
were undertaken to meet the others. Telephone interviews were also conducted as it was cheaper but this was limited to two cases.

Some of the attempts to recruit interviewees turned out to be fruitless because of their tight schedules etc. However, it was considered that ten experts in the field of intellectual capital and eleven in the field of maintenance of work ability cover a relevant range in relation to the wider universe (Mason, 2002). The use of sampling categories, as expertise in the two areas focal to this study, provides access in an interpretative sense to something that the researcher is interested in rather than ready-made answers from interviewees to the phenomena being researched as the focus of interest (Mason, 2002; Alasuutari, 1994).

The aim of this research is not to make statistically significant generalisations and therefore the interviewees do not represent all the experts in these fields. Mason (2002) calls this kind of sampling strategic. She argues that even though representative sampling is probably the most commonly understood form of sampling, it is problematic in relation to qualitative researching because the analytical logic of qualitative research does not support the generation of representative sampling particularly well.

It is important to note that the discussion above about sampling goes only for essays three, four and five in the forthcoming presentation of the research essays. The first essay is purely theoretical and the second essay is a result of a research project that was originally separate from the original setting. I participated in this project when the data collection was already completed and therefore was unable to influence the strategies employed. In general, similar considerations of focus, practical and resource-based aspects are also valid for this study. The discussion regarding representatives has even less significance to this study, because the research setting is built around the logic of case studies.

Even though methodical selections may be based directly on research practices, like meaning, aims, resources and tools available in performing the study, familiarity with methodological backgrounds may be vital in justifying the study and its results within the science community. Methodological considerations are usually targeted at the justification of results as verified findings. The justification is the privilege of the scientific community, and thus the role of methodological considerations is to present, justify and defend the findings. The central focus is thus given to the evaluation of methodological validity instead of analysing ideology on which methodological selections are based. The reflection of this scientific ideology can be seen as relevant because it influences both the creation of theoretical background, as well as the implementation of chosen methods, to create the actual results. However, this ignores the importance of analysing the process that leads the researcher to find these results, that is, discovery. In this setting it is taken as given that scientific ideas arise from a researcher’s creative intuition. (Raunio, 1999.)

According to the methodological fundamentalism, the methods cannot be chosen by analysing what alternative is most applicable to solve the research problem, but the researcher should consistently stick to methods that resemble certain scientific ideology. The methodological fundamentalism is not a very applicable approach when trying to
create new knowledge because methods are seen as tools for convincing the scientific community about the adequacy of the results, that is are the results consistent with what is already seen as true. A pragmatic view, on the other hand, is based on the view of the researcher as a decision maker and problem solver. The research that is aimed at solving the problem rests essentially on the researcher’s informed consideration instead of intensively following research practices tied to certain methodological grounds. Methods are more like heuristic tools that help in pursuing an applicable solution to the problem at hand. (Raunio, 1999.)

I have undertaken my study relying on the pragmatic view. Even the very setting of my study advocates this solution since it is the problem of how the maintenance of work ability could be beneficial to a company’s intellectual capital that I am aiming to solve. There is of course a precise scientific ideology that has guided the whole framing of the research problem. In my view business administration creates most valuable but also profitable results when it takes the sustainable economical development as its cornerstone. Pursuing short-term profits must not be the ultimate goal of the company but it has to be willing to make investments, for example, on the wellbeing of its employees in order to secure longer-term success in an economic sense along with a more humane working life. On the other hand, I have quite a pragmatic ideal of science and wish to do such research that is able to produce new concepts and tools that are hopefully applicable even to real-life organisations for development purposes.

Even though I have tried to stick to commonly accepted definitions as far as possible, it has also, of course, sometimes been necessary to give my own input. Sophisticated conceptual contemplation is also dependent on language skills. I would like to give as examples the processes of finding the title for the first and third research essays in this thesis. As is well known, a felicitous title is essential for a good essay. My original idea was to call the first “Restructuring Knowledge Management”. Further analysis revealed that this choice would have been misleading because I do not introduce new “bricks and mortar” to the framework but instead I scrutinise the relations between well-established concepts in a new way, that is the configuration (von Wright, 1992). Thus the title changed to “Reconfiguring Knowledge Management – Combining Intellectual Capital, Intangible Assets and Knowledge Creation”4. Accordingly the third was originally entitled “Maintenance of Work Ability and Intellectual Capital – a Wellbeing Perspective”, but this was modified to “Decomposing Intellectual Capital From a Maintenance of Work Ability Point of View” that describes the idea of the article, whereas the earlier version tells practically nothing about the content. This problem also resulted in rejections in response to submitting this article to journals.

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4 Here I would like to thank Verna Allee for contributing to this development. It was her idea to introduce the concept ‘configuring’ into this title. Von Wright’s writing on Wittgenstein’s image theory convinced me of the accuracy of this solution.


4 LIMITATIONS OF THE STUDY

It can be argued that the structure of this thesis follows a causal chain that firstly discusses the changes in production and work life and secondly continues by scrutinising the new requirements targeted at the employees. Thirdly, these new requirements call for a different leadership in order to be effective and, finally, employees’ wellbeing is seen as a central element of this new leadership approach.\(^5\) The main task of this thesis is to discuss the third and fourth links of this chain from an intellectual capital point of view and a maintenance of work ability point of view. This focus results in a limited handling of changes in work life and new requirements targeted at employees resulting from this development, which are the first and second links. The discussion around these themes is presented as an introduction in the overarching essay of the thesis. This may seem a bit vague for a reader with a background in work life sociology, for example. Themes like the geographical scope of increasing knowledge-intensiveness and intensity of influences on different lines of business are examples of interesting phrasings of questions, but they are beyond the scope of this thesis.

Specific attention has been given to the required leadership approach (link three) and the role of work-related wellbeing as an element of it (link four). On the other hand, there is also a vast amount of literature on work related wellbeing beyond the maintenance of work ability, but this study was limited to these frameworks in order to narrow the theme into a researchable topic.

There is very little material on the maintenance of work ability (MWA) written in languages other than Finnish. It can be asked whether this limitation reduces the possibility of evaluating this study in the international context beyond the Finnish setting. This challenge is met by the argument that one of the originating aims of this study was to explore the Finnish maintenance of work ability approach with an internationally well-known framework, which is the intellectual capital framework. As the results of the study show, maintenance of work ability has considerable potential in terms of developing knowledge work, but this requires altering the original emphasises of the approach.

Adopting policy-oriented documents for the references stems from the nature of the MWA framework. As the results of essay four in the thesis show, MWA has long been a policy approach in Finnish society aimed at reducing the costs of the social security system. Furthermore, essay four shows how MWA could be developed from this policy orientation towards a systematic framework applicable for developing work life and business activities of organisations. Thus, scrutiny based on intellectual capital literature gives grounds for evaluating MWA in an international context.

On the other hand, deeper conceptualisations to define ‘knowledge’ are not included in this thesis. There are definitions contributed as part of the knowledge management literature, like knowledge is true justified belief (Nonaka – Takeuchi, 1995) or capacity to act in a wide variety of situations to create tangible and intangible assets (Sveiby, \(^5\) The author would like to thank Professor Kaj Frick for this acute conceptualisation.)
A more philosophically oriented audience might see the definitions used in knowledge management discourse as being a bit vague. It has been argued that these definitions of knowledge depict knowledge as some kind of tool or structure to carry out various activities. According to this view, knowledge as such is not the issue but rather knowing in terms of competitive advantage. In particular, the division into tacit and explicit knowledge, which is central to the knowledge management theory, is confronted as some kind of Holy Grail that will enable magnificent things to happen as soon as the codes of tacit knowledge have been deciphered. On the other hand, the concept of management is also criticised in this setting because its definitions are often argued to be rather open-ended formulations instead of generally applicable phrases. Thus the whole concept of knowledge management, which combines these two problematic concepts into one single entity, can be challenged. (Styhre, 2003.) But as noted earlier, this theme will not be elaborated further in this thesis.

The methodological section of this overarching essay is based especially on essays three, four and five. The first essay “Reconfiguring Knowledge Management – combining intellectual capital, intangible assets and knowledge creation” is purely a theoretical scrutiny of the central concepts around knowledge management research. The second essay “Managing Intangible Assets – a question of integration and delicate balance” is originally part of a separate research project but it was considered useful to include it in this thesis. However, the research method of the second essay follows an approach similar to that described in the method section with the exception that it is related more directly to the grounded theory.

It can be stated that essays three, four and five stand out as the original empirical work to answer the research questions of this thesis. The other two essays are more of a background, continuing from the setting of this overarching essay, for the analysis of the empirical data of this thesis.
5 DESCRIPTION OF THE ESSAYS IN THE THESIS

In the next section I will describe the research essays that constitute the thesis. This thesis consists of five essays that discuss different aspects of knowledge management and work-related well-being. The first one defines knowledge management in a new manner by combining the central concepts to this discussion, namely intellectual capital, intangible assets, and knowledge creation, into one singular model. The second article continues the analysis by identifying different elements of intangible assets by scrutinising nine case companies. The third essay outlines the interview data of intellectual capital experts by having the maintenance of work ability as the framework of analysis and thus provides a well-being perspective on the discussion around intellectual capital. In the fourth essay this is elaborated on by scrutinising the interview data of maintenance of work ability experts from an intellectual capital point of view. The fifth essay focuses on the finding made in the previous essay that individual and work community levels can be identified in relation to MWA. These two levels are related to the management-leadership distinction that is at the core of organisation studies.

5.1 Reconfiguring Knowledge Management

The first essay is entitled ‘Reconfiguring Knowledge Management’. This study, which is based on a literature survey, builds a framework in which intellectual capital, intangible assets, and knowledge creation are combined into one unitary model. Earlier, these concepts have been, at the best, only parallel to each other. The pursuance of this combination also results in a sharper definition of knowledge management that has earlier been defined rather vaguely.

Intellectual capital is argued to be the source of long-term performance of a company. It has commonly been defined as consisting of three different dimensions. However, there is some disagreement as to the labels that have been used for these dimensions. In this study the dimensions are human capital, internal structures, and external structures. This approach is sort of a hybrid as it takes elements from the work of both Edvinsson and Malone (1997) and Sveiby (1997). The labels are similar to those of Sveiby with the exception of human capital that is used instead of individual competence. The rationale behind this deviation is that human capital is a broader concept, in which competence is included as well as health, for example. The importance of this broader scope becomes understandable in relation to the subsequent articles. On the other hand, external structures are seen as a broader concept, than customer capital that is used by Edvinsson and Malone (1997). Besides customers, external structures also include sub-contractors, collaborating partners, competitors and legislative regulation.

More recently, the concepts of structural capital and relational capital have become increasingly popular. However, this categorisation was not adopted for this study because this easily obscures the practical division between intra- and extra-

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6 Research article number 1. Published in Journal of Knowledge Management Vol. 8 (2) 2004, pp. 36 – 52.
organisational entities. It is difficult to see that structural capital reflects the inside of an organisation, whereas relational capital is targeted outside it. Relationships also exist inside companies, and there are many kinds of structures outside the company that influence how a company functions. Following the labels defined by Sveiby (1997) it can be argued that it is the different structures that are relevant for both of these dimensions and one very common manifestation of them is the different relationships.

The value platform (Saint-Onge et al. in Edvinsson – Malone, 1997) model is used to describe the holistic nature of intellectual capital. The paper argues that there is actually nothing new in intellectual capital, if the three dimensions are taken as separate entities. Different activities focusing on human capital can be traced back to at least the 1950s, when human resource costing and accounting originated. Improvement of internal structures can be seen as having the longest history because the scientific management approach was created for this approach. Finally, different customer satisfaction explorations etc that are part of external structures also have a very long history. It is the intersection of all three dimensions that forms the basis of knowledge-based value creation. However, the value platform cannot elaborate on the mechanics of this value creation.

Many authors prefer the term ‘intangible assets’ to ‘intellectual capital’. For example, Sveiby (1997) and Lev (2000) have been proponents of the former. On the other hand, intangible assets have been criticised for the static nature of the concept that is not in accordance with the dynamics of the knowledge-based value creation (see, for example, Johanson – Skoog, 2001). Ahonen (2000) made a division based on intangibles discussing the relationship between generative and commercially exploitable intangible assets. This outline is adopted to define intangibles in this study. The division into generative and commercially exploitable intangible assets reveals the logic behind value creation that was beyond reach for the value platform model. The realisation of the potential that lies in generative intangibles in commercially exploitable intangibles shows how intangible assets create value. Commercially exploitable intangible assets form the basis for the current intangibles-based cash flow, whereas generative intangible assets are the source for renewal and the creation of future commercially exploitable intangibles. The static nature of the concept of intangible assets reveals the deficiency of this model as it cannot describe how generative intangible assets are converted into commercially exploitable form.

The static nature of intangible assets requires a dynamic element to meet the interrelatedness of different elements that is present in intellectual capital. This paper argues that the theory of knowledge creation can be seen as an outline of this dynamic. Nonaka and Takeuchi pioneered this theory with their seminal work in 1995. It has been generally accepted that the knowledge creation theory has a central position in knowledge management. However, there have been no serious attempts to link this approach to the general discussion around intellectual capital. By seeing the theory as the dynamic element of intellectual capital, this study makes the connection.

The later work of Nonaka in collaboration with Toyoma and Konno (2000) has resulted in a model called ‘Unified Model of Knowledge Creation’. This model was used as a starting point for developing the synthesis of the ideas presented above because many elements can be used as such. However, in the ‘Reconfigured Model of Knowledge
Management’ the knowledge assets outlined in the original model are replaced with intangible assets following the distinction made above. In the original model, knowledge assets are both the input and output of the SECI process. This simultaneously determined nature obscures the economic impetus of knowledge creation because it does not reveal the logic of value creation that takes place in this transformation.

Moreover, the relationship between ba and the SECI process is outlined a bit differently in order to clarify the relationship. In the original model, Nonaka et al. argue that the relationship between ba and the SECI process should be moderated by knowledge assets. This makes the knowledge assets an even more complex concept. To avoid this setting, in the reconfigured model of knowledge management ba is situated near SECI as it is the context in which SECI takes place.

The model presented in this study suggests that it is both static intangible assets and the dynamic processes of knowledge creation that together constitute intellectual capital. Furthermore, this approach overcomes the limitations of each element described above. The role of knowledge vision is also clearly identified.

This essay indicates that knowledge management and intellectual capital are very close to each other but there is one difference that separates them. The knowledge vision is included in the former but not the latter. Thus intellectual capital is defined as consisting of both static resources, labelled generative and commercially exploitable intangible assets, and dynamic processes that are related to knowledge creation by Nonaka et al. Knowledge vision, however, is external to this entity because it is the frame of reference against which the intellectual capital of an organisation is defined. In this paper knowledge management is seen as the managerial approach that aims at harnessing the value creation potential of intellectual capital.

5.2 Managing intangible assets

The central position of intangible assets leads us to consider their identification. This question is approached in the second essay that focuses on the management of intangible assets. Unlike the previous essay, which was completely based on theoretical scrutiny, this essay is empirical by nature. The starting point for this study was to identify companies listed on the Helsinki Stock Exchange that had a considerable market-to-book value difference. A wide variety of company sizes and industries was another goal. The willingness of the companies to participate in the study also was a natural criterion of selection resulting in nine case companies.

The study data were collected in three phases. The first interview was conducted with financial analysts in order to identify reasons behind the high market value added on the

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general level and in more detail by focusing on commercially exploitable and generative intangible assets. The company interviews started with executives who were able to identify key personnel responsible for intangible assets observed in the analyst interviews. The key personnel interviews were conducted using actual research questions. These key personnel typically worked in fields such as general management, Human Resources, Production functions related tasks, marketing and R&D. The interviews with the key personnel discussed the company’s strategically most important resources, their development and the people responsible for these resources. They were also asked about measurement practices concerning intangibles and their development, linkages to financial monitoring and internal and external end-users of reports on intangibles. Questions were also asked about the implications of the measurement of intangibles on management practices both at the strategic and operational levels. Finally, future challenges were discussed.

The study’s case companies were divided into four groups because the analysis of the data showed that a primary and secondary dimension of generative intangibles could be identified for each company. Besides describing the strengths of each company this categorisation also makes it possible to analyse weaknesses. This view is based on the idea that the third dimension is more or less neglected in every case company. Besides a description of each of the four groups, the understanding was further elaborated by describing a case company belonging to each group.

In the group of “Successful Networking” the most valuable intangible asset is the capability of the company to manage different external networks. Intensive collaboration with foreign partners acting within the same branch has made it possible to create new ways of doing business. They have a similar aim to gather the customer relationships into efficiently manageable networks. The role of the brand is essential. A strong organisational culture helps to maintain high quality of customer services. However, the development of human capital is subordinated to the other dimensions of intangible assets. This results, for example, in the organisational inability to gather insights of frontline personnel acquired in daily interaction with customers.

Stockmann is one of the leading retailers in Finland. It has an established position in the consumer retail business. The reliable brand and customer loyalty are the central strengths of the organisation. The brand and customer service orientation are supported by a strong organisational culture that directs the daily life of the employees.

The "Learning Systems” companies build their intangibles around the competence related to production process efficiency. The aim of process development, on the other hand is to take the different customer needs into account at the earliest possible phase of production. Because of tight competition these companies have to constantly develop innovations. Thus the role of Research and Development is very significant. Openness in communications and maintaining employees’ competencies allow smooth adaptation to changes. External structures are a challenging area of development because market orientation can be difficult for processing industry companies. This is easier for smaller organisations but larger competitors are able to exploit a scale of economy that is central to this line of business.
Constant innovativeness and renewal of the products is a lifeline for Nokian Tyres. It is a small unit competing in the highly competitive field of manufacturing. The scale of economy is beyond its reach so Nokian Tyres has to seek higher profits by developing products with considerable margins. This objective is pursued by a rousing organisational culture motivating employees to the constant development of production processes. A high level of competence of the personnel is the prerequisite for development.

"Competence Without Boundaries“ companies are essentially based on the innovation potential of a highly competent personnel. In the commercialisation process of innovations patents are very significant. The legislative regulation of Finnish companies falling into this group is relatively small compared to foreign competitors. This difference has given these companies the relevant competitive advantage. Characteristic of the organisational culture is that research and development is very autonomous implying that R&D personnel have had the greatest possible freedom to create innovations. As the strategic biases are changing towards international markets, the companies try to expand their competence to new markets both geographically and in the sense of new branches. The increasing size of the organisation demands the development of internal structures. This can even be contradictory to the organisation’s history, if the ability to generate innovations has been especially based on a loose organisational culture.

It has been characteristic of the history of Sonera that competent employees are allowed to operate rather freely in developing mobile communication solutions. At the same time, Finland has been favourable ground for developing new communication solutions. Thus Sonera has been able to develop competencies in the domestic markets that are then launched on international markets as more sophisticated solutions than those provided by the competitors.

"The Network of Excellencies” companies are rather strictly regulated. It is necessary for a company to have competent personnel to be able to meet the challenges of the strict regulation. The companies have built networks with, for example, universities and research institutes. Because of the strict regulation, the innovation as such is insufficient. The commercialisation of a new product may even take several years and thus is very expensive. The protection of those products in the market by intellectual property rights is highly important for these companies. For this group, the internal structures are the most important area of development because the commercialisation of innovations needs to be as effective as possible. There is an increasing need for solid processes that help identify the profitable development tracks and secure progress in those.

Regulation is strict in the pharmaceutical industry. That is why Orion has been very dependent on highly competent R&D personnel, as well as contacts to external research bodies as sources of product innovations. Patents are very significant because development costs of a new drug are enormous and legal protection is the main way of securing the profitability of these investments.

Besides providing insights into the identification of intangible assets this study also discusses an approach for the categorisation of organisations. As the classification
shows, similarities can be found across companies even though their intangible assets are highly company-specific by nature. Seeing this study in the light of later research shows some inconsistency in the focal concepts. The terms ‘intangible assets’ and ‘intellectual capital’ are used interchangeably in this paper. As the careful reader may observe, the previous article was written later than this one. Advances have also been made in theoretical considerations and in the later study the distinction is already made.

5.3 Decomposing intellectual capital with the maintenance of work ability framework

The third essay makes a completely new contribution to the discussion around intellectual capital. The first essay described above showed the central role of knowledge creation. This is a cognitive activity, which inevitably requires human beings. The wellbeing of the employees is the key to the company’s long-term sustainable development because the employees are the source of the company’s innovativeness and renewal capability. In this essay interview data on intellectual capital experts is analysed by having the Finnish Maintenance of Work Ability perspective as the frame of reference.

In Finland, the maintenance of work ability is the central framework for generating wellbeing at work. This means not only preventing illnesses, but also the development of work life in a proactive way. Health improvement is also the essence of, for example, the Anglo-American work site health promotion (WHP) approach. However, the maintenance of work ability is a much broader framework because includes not just the individual’s health, but also competencies, a well-organised work environment and a functional work community. The essence is that these areas are developed in a holistic manner. The maintenance of work ability has a well-established position in Finland because it has been written into the law on occupational health.

In this study, both Finnish and foreign interviewees represent top-level expertise in the field of intellectual capital. The selection criteria for the interviewees were a recognised level of expertise and the aim of gathering experts with various occupational backgrounds. Thus there are representatives from research, consultancy and business enterprises.

When analysed by MWA as the theoretical framework, the data shows that the most significant change by intellectual capital has been the shift from individual to collective features of competence. In the earlier frameworks competence was seen as static whereas the intellectual capital discussion emphasises dynamics and an organisation’s ability to create new knowledge. It is not so much about analysing the existing competence base but the ability to renew that is in the focus of interest. Besides organisational renewal, competence is also the basis for current business activities and thus financial performance. This perspective reveals a tension that is present in current business life. Companies have to maintain financial results at almost any cost and at the

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same time also take care of renewal. Very often it is the short-term perspective that is valued more than the long-term. This bias can be harmful because the changing business logic may value the competence-related investments highest in the future.

The originating idea of competence as an element of MWA is to secure professional skills and thus alleviate mental strain. The IC discourse aims instead at creating value by the knowledge-based resources of a company. These perspectives are not contradictory because combining factor behind both of these approaches is sustainable economical development.

Removing occupational health hazards was the starting point for the development of work. Thus work environment improvement is also a natural dimension of MWA. Increasing knowledge-intensiveness has highlighted ergonomics because information and communication technology-based tools are being used in the new working tasks. In the intellectual capital discussion, the approach is somewhat different because the data discusses a lot about new alternative ways of working. It is characteristic of these opportunities that they are generated by information and communication technology (ICT). The effectiveness of information flows reduces obstacles that relate to geographical distance, for example. It is often the case that companies may be interested in postponing the ICT investments to obtain short-term cost savings. However, these advantages can easily be lost as the system increasingly malfunctions etc. Another perspective in relation to the work environment is the development of the work environment to support the creativeness of the employees. With the exception of system malfunctions that can be seen as an ergonomics-related issue, this view is very different from the original MWA approach of eliminating occupational health hazards.

In general, the differences between IC and MWA in relation to the work environment are worth noticing. It is characteristic of the IC perspective to emphasise the positive effects of information and communication technology and more broadly the whole work environment, whereas MWA focuses on different threats. In addition, on the whole reading the data from a work environment perspective resulted in few citations. Therefore, it would seem that MWA gives many new insights into the discussion around intellectual capital and work environment, as well as vice versa.

The work community and its atmosphere are seen as important determinants of work ability. The need and requirements of a new leadership style are identified in the MWA literature. The research that aims to alleviate strain in the work life has shown that the opportunities to control tasks and optimise the pace are central areas of development in relation to the work community. In the IC expert interview data mutual appreciation is seen as characteristic of a well-functioning work community. The constant reflection of learning and tools being used is a central prerequisite for organisational development. In such a setting leadership is not so much about supervision but rather more ability to stimulate different relationships is increasingly needed. On the other hand, the ability to crystallise the organisation’s vision is also needed. The new leadership paradigm breaks down the old power structure as it shifts responsibility to employees, but at the same time, work becomes highly motivating.

Restructuring leadership practices increases the employees’ chances to influence the functioning of the organisation. But, on the other hand, the work community also must
be able to provide social support for its members. This is a buffer against rapid changes caused by the need for organisational renewal. The insights of IC experts interviewed for this study are well in line with those of the MWA theory.

In the literature health as a broad concept is seen as a central element of MWA. This means that besides physical, mental and social capabilities are also included in the definition. The burnout syndrome has been topical in MWA literature. Physical health has been emphasised to some degree in companies’ activities. However, social resources, especially, are a prerequisite for the success of the membership in an organisation. Insufficient mental and physical resources make it difficult to act as a member of a work community.

The conclusion of this study is that wellbeing at work is generated by the simultaneous mastery of all four linkages. Thus the most topical challenge in modern work life is the ability to mould individual competencies into an organisational characteristic. However, performing this modification requires that various aspects of the work environment, work community and employees’ health are developed accordingly in order to ensure the shift of focus.

This study does not emphasise the role of human capital over other dimensions but the holistic approach to intellectual capital is characterised. The originating idea of this study was to identify linkage points between constituents of intellectual capital to those of Maintenance of Work Ability. It turned out that dividing intellectual capital into its elements was not a fruitful approach for this study. Thus the data on intellectual capital was taken as a whole and analysed from four different perspectives that constitute Maintenance of Work Ability.

5.4 Maintenance of work ability from an intellectual capital point of view

In the previous essay the importance of employees’ wellbeing was shown in relation to IC, but it was not possible to elaborate the relationship further with that data. In this essay, the attention is turned to maintenance of work ability experts in order to further elaborate this finding. The data corresponds to that used in the previous study but in this case the interviews were carried out with MWA experts and accordingly some minor modifications were made to the questions. In this data set, it was also an important goal to ensure that all institutions central for the MWA framework are represented. Therefore interviewees are from research institutes, business enterprises, consultancy, labour market organisations and insurance companies. They all affect the maintenance of work ability in different ways.

The research design of this paper is built around the economic characteristics of MWA from an IC perspective. Traditionally the considerations in economic terms have primarily focused on avoiding costs related to sick leave, for example, and, on the other hand, increasing the productivity of an organisation. However, considering this theme from an IC perspective makes it possible to scrutinise the effects that are directly linked to the value creation of an organisation.

9 Research article number four. This article has not been published in any form before the thesis.
Because of the holistic nature that is characteristic of the maintenance of work ability it was natural to adopt the three dimensional definition of intellectual capital as the framework of the analysis. This approach makes a considerable difference, for example, in relation to earlier studies that have focused on work site health promotion and thus the opportunities for analysis are unavoidably limited to human capital. When looking at the MWA framework, internal structures, in particular, stand out as being as equally important as human capital. However, the analysis from the external structures perspective will turn out to be important, as well. In the paper, the IC framework is first described on a general level and each of the three dimensions are discussed in more detail in relation to findings with that specific point of view.

The scrutiny of different individual resources, which are characterised as health-related physical, mental and social resources, competence and attitudes, is characteristic when analysing the data from the human capital point of view. This approach arises from a view that work ability results in the compatibility of an individual’s resources and the work requirements. Based on the data, it would seem that work-related health is seen as the most important characteristic, as most development activities are targeted at it. However, competence is also seen as an increasingly important resource. This seems to result from the changes in work life that require increasingly cognitive capabilities instead of just physical functioning capability. On the other hand, this resource-emphasising view was also criticised in the data, because it was argued that it separated these resources from the actual work tasks.

In the IC framework, the competence is the central element in relation to human capital. On the other hand, health is practically neglected in this approach. This suggests that the two frameworks can provide important insights into each other. Especially in terms of aging it is interesting to see that the MWA data focuses mostly on the negative features, such as decreasing physical resources and obsolete competencies. The IC framework, on the other hand, tackles important positive features, such as tacit knowledge and collaboration abilities. It is the nature of tacit knowledge that it accumulates along with age. On the other hand, collaborative skills are also shown to improve along with age. These two features are central in knowledge-intensive work as the creation of new knowledge is dependent on these abilities.

In terms of internal structures the MWA data focuses on work as the context shaping the employees’ workload. According to the interviewees the introduction of new tools, such as information and communication technology, also places great demands on developing work practices. However, it is argued that the managers alone cannot meet these development requirements, but the participation of the work community as a whole is required in order to find applicable solutions. This setting places great demands on leadership practices because empowerment is seen as a necessity. It is stressed in the data that the maintenance of work ability should be seen as a constantly ongoing process within an organisation instead of different separate projects.

Even though there are many similarities between the MWA data and the IC framework in the internal structures perspective, a detailed scrutiny reveals that they are still targeted at rather different goals. MWA is more a reactive framework by nature, as it aims at identifying and solving the bottlenecks in work processes, which are excessively increasing the employees’ workload. IC, on the other hand, is a proactive framework
that essentially aims at developing new knowledge. Thus the physical and cultural infrastructures of an organisation are also developed to serve this purpose.

The external structures point of view in the MWA experts’ interview data shows the importance of occupational health care services. It is argued that this is a result of the development of the MWA framework in close relation to the Finnish social security system. MWA has been introduced as a counteraction to increasing disability costs burdening the social security system. Instead of tightening up the grounds for social benefits, Finland adopted a policy of preventing illnesses and supporting employees’ resources so that they would be able to continue participating in work life. It is argued in the data that the changes of modern work life, such as the increase in competition through globalisation, also cause different requirements in relation to MWA. The expertise of the occupational health care service alone is no longer sufficient, but there is an increasing need to combine different perspectives for creating a better understanding of the complexity of modern work life.

In the IC theory, external structures focus especially on the customer relationships and innovation creation through extra-organisational relationships. However, there have been some studies that have taken a broader perspective on external structures. In these studies, different features of the surrounding society, such as legislation, have also been taken into consideration. Yet it has been characteristic of the IC framework that it has focused on the prerequisites of knowledge creation and commercialisation. However, issues related to the health and social security system are relevant also in terms of IC because they are conducive to employment and thus the availability of human capital.

Based on these findings it can be seen that the points of view of human capital and internal structures are central in shaping the content of activities undertaken as MWA. The external structures perspective focuses primarily on discussing the background factors that shape the nature of these activities. Therefore, the scrutiny of the MWA data from an IC point of view enables the pre-assumptions behind the current MWA framework to be outlined and also a modification that meets better the requirements of knowledge-intensive work. Scrutinising the data reveals that the MWA framework is historically closely related to the social security system. The ageing of the labour force has resulted in expectations about increasing disability. To meet this challenge an approach preventing disability more proactively, along with rehabilitation, has been adopted into the Finnish social security system.

Because of this goal that relates MWA to disability, it has been quite natural that health has been adopted as the central target of influence. However, as an exception to work site health promotion, for example, the focus has been elaborated to cover work-related health instead of general health improvement. Although the MWA framework also includes competence, the work community and work environment, these aspects are somewhat subordinate to health. Thus, for example, handling observed competence gaps is seen as important because insufficient mastery of work tasks results in stress and eventually burnout. Accordingly, the work environment is seen as a source of potential risks related to ergonomics or exposure to harmful ingredients. The work community, in its own right, is seen as the psycho-social context of work that can provide social support, for example, but harmful features, such as work place bullying, can also occur.
The IC theory-based modification of the MWA takes the customer as the starting point instead of disability. Following the terminology of the Danish IC Statement Guidelines, the organisation uses its intellectual capital to create a well-defined use value, for which the customer is willing to pay. In the process of creating use value the employees’ competencies are the central resource. However, in contrast to the MWA framework, IC does not take competence as an individual’s characteristic but it is seen as a collective phenomenon by nature. Thus in this modified version the work community is a feature directly linked to competence. Health and the work environment are also important elements in this setting, but here their role is to shape processes that make the functioning of the work community more effective. The employees’ health is a meaningful point of view because illnesses may prevent employees from participating in the activities of the work community. On the other hand, the work environment can also be designed so that it supports the communal features of work.

As can be seen above, even though MWA and IC have quite different axioms, upon which they are built, this scrutiny suggests that they even surprisingly have much in common. Despite the differences it is still mostly the areas of emphasis that vary in these two frameworks. Organising the same elements in a different way was a sufficient manoeuvre to adapt the MWA framework to tackle the central challenges of IC.

5.5 The managerial relevance of maintenance of work ability – a Finnish perspective

Research on MWA has shown that companies perceive these activities as also having considerable financial benefits (Peltonäki et al., 2002; 1999). However, there has been only a limited amount of research on the mechanics behind these effects. The most popular explanation has been the increasing quality of products and services (see, for example, Ilmarinen, 1999; Aro, 1998; Rouhesmaa et al., 1998; Matikainen, 1995). This paper argues that economic implications take place through improved organisational performance. MWA is shown to be beneficiary for business administration.

This essay continues from the foundations laid in the previous essay, in which it was shown that both individual employees and work communities as a larger entity can be seen as the targets of MWA activities. Even though this dualistic nature of the MWA framework is widely accepted, there is a considerable tendency to emphasise one in favour of the other. Otala and Ahonen (2003) are among authors who have stressed the importance of seeing both of these approaches in relation to each other. In this study these two approaches were combined by analysing data from both perspectives. The data of this study consists of the same interviews that were used in the previous essay.

The analysis of the interview data from an individual level point of view relates MWA to the social security system and early rehabilitation. These are seen to have notable implications on the Finnish work ability concept because MWA is argued to have originated as an antithesis of disability. The criteria for disability to work are medical-

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social by nature and therefore individuals’ resources and especially health are strongly emphasised. Many of the experts interviewed see health as a fundamental prerequisite for capability. It is seen to form a foundation on which other elements of work ability are built. Thus, any reduction in health is seen to have a direct effect on work ability.

Accordingly, the interviewees see that strengthening the employees’ competencies, which are essential for working, improves the mastery of work tasks and thus work ability. Competence includes professional skills, communication abilities, information technology skills and language skills. As business life becomes increasingly knowledge intensive, the competence issues become ever more important.

The data of the study also strongly brings forth the idea that occupational safety issues form the grounds for work ability because exposure to physical, chemical and biological risk factors, as well as insufficient safety systems, can create occupational accidents or disease causing disability. In Finland, considerable attention has been paid to occupational safety issues and generally work environment risks are well managed but work environment experts still have many challenges to tackle.

The individual level approach is also criticised by some of the interviewees because it is seen to emphasise developing the employees’ resources to better meet the work requirements and ignore the possibilities of developing the work context. It is argued in the data that the proponents of this approach see developing the work requirements as a last resort if other alternatives have proved ineffective.

When analysing the data from a work community perspective, the MWA experts interviewed stress the work community’s role in initialising development planning processes as the core of the maintenance of work ability approach. It is the work community that creates the goals, job descriptions, the combination of tools, ergonomics, mutual interaction, strategies etc. so that they either improve or destroy work ability.

It is argued by the interviewees that the work communities collectively innovate ways of working. This process includes both identifying bottlenecks in the work fluency and the planning of activities to overcome these problems. Identifying the bottlenecks is a context-bound process. The problems can be characteristic of a certain industry or even specific work community. According to the experts interviewed, this development requires leadership practices that emphasise empowerment. Empowerment is built by letting the individuals influence the goals, and analyse their work ability in relation to improvements that they find most essential for supporting their wellbeing. According to the interviewees, successful empowerment brings out the positive energy residing in a work community that could not be put to use by a coercive management approach.

The data show that collective development of work requires a well-functioning work community in which information flows efficiently; everyone knows the expectations and gets social support from the boss and colleagues. The significance of different informal networks is essential in modern work life. One has to be familiar with different formal and informal networks in order to easily organise issues in an organisation. The central role of different events, such as sports days and other social gatherings, organised by the employer was also discussed to a considerable degree in the data. They
are seen to create one arena that enables informal networks to be formed. However, the common feature of these events is that they have no direct connection to actual work tasks and its problems that are observed by the employees. If an event is successful, positive results can be achieved for a limited time as social relations are improved in the work community but because of the few long-term effects they have proved to have a rather weak influence on work ability.

Having performed the analysis, this distinction was related to academic discussion around management and leadership. This view clearly indicates that activities targeted at individuals are characterised by a management approach whereas those targeted at the work community are related to leadership. Management is characterised by stability, order and efficiency to meet the given goals. Leadership emphasises flexibility, innovation and adaptation in the search for organisational change by developing a vision of the future and strategy for making the necessary changes. (Rollinson and Broadfield, 2002; Yukl, 2002; Rost, 1991; Kotter, 1990a; 1990b.)

MWA activities targeted at individuals are characterised by management features when related to the definitions above. In this approach individual resources are seen as a prerequisite for coping with the requirements of work. Improving health, for example, represents an attempt at solving conceivable problems and thus improving the functional capability of an organisation. Exercise, for example, is easily implemented and monitored for results. An individually oriented approach to MWA relies on an authority relationship because the expert defines deficiencies and suitable remedies.

In modern work life, the ability to perform given tasks is insufficient as such but collaboration leading to innovations is increasingly needed. This shift of emphasis highlights the importance of work community-oriented MWA because the functionality of the work community becomes an important competitive factor. MWA activities targeted at the work community level have obvious leadership characteristics because they stress the empowerment approach in defining the organisation’s development needs.

It is important to note that neither of these can be seen as better or more important than the other. Kotter (1990b) has argued that too tight management suffocates an organisation’s innovation capability whereas excessive emphasis of leadership results in reduced organisational effectiveness. Accordingly, MWA activities must be seen in a balanced way. This means that a work community-oriented leadership approach to MWA builds the framework for the collective development of work and individually-oriented managerial MWA ensures that the organisation has suitable resources at its disposal. In modern work life there is an increasing need for the constant development of work tasks, but at the same time both the physical and mental abilities of the employees must be sustained.
6 CONCLUSIONS AND DISCUSSION

The aim of this study was to open new insights into links between intellectual capital and the maintenance of work ability. These concluding remarks will show that MWA is essentially conducive to improved knowledge creation.

The conceptual model that results from the first research essay provides a general framework for outlining the conclusions of the whole thesis because it outlines the definition of knowledge management used in this study. The relationship between knowledge management and intellectual capital was discussed in the research essay and there is no need to repeat it here. The case study supports a division of intangible assets into generative and commercially exploitable intangibles and further into primary and secondary dimension of generative intangibles. The former classification is an element of the above-mentioned model and the latter highlights the importance of the interaction of generative intangible assets.

Further scrutiny of the interaction of generative intangible assets reveals that knowledge creation unavoidably requires the human factor. Employees’ wellbeing enhances the readiness to contribute to the knowledge creation process. Supporting employees’ wellbeing with the MWA framework is beneficial for knowledge creation as it covers the balanced development of competencies, the work environment, the work community and employees’ health. However, this emphasis on knowledge creation requires a different approach with respect to the maintenance of work ability framework than has been commonly adopted in Finland, because the competence and work community should be taken as the focal dimensions instead of health.

Deeper analysis of the MWA as the framework for supporting employees’ wellbeing reveals that the individual-oriented level of MWA can be related to management, whereas the work community oriented level has characteristics of leadership. This finding is relevant for the theory of knowledge creation because the concepts of management and leadership have also been related to the SECI model (see Figure 4). To put it briefly, the leadership perspective as an element of the knowledge creation theory represents generating new ideas, and management is necessary for embedding them in daily functioning.
Finally, the current study links the enhancement of employees’ wellbeing by MWA to the original ‘Reconfigured Model of Knowledge Management’ through the role of MWA as a framework for building and energising ba. As defined by Nonaka et al. (1998; 2000), ba is the foundation for the SECI process as it provides a context for knowledge. The relationship between SECI and ba is further scrutinised by Nonaka and his associates (see, for example, Nonaka et al., 2000; Nonaka – Konno, 1998, see also Hussi, 2003b). The conclusion of this study is that employees’ wellbeing, supported by the maintenance of work ability, becomes a relevant framework for developing the variety of ba in an organisation. Work community-oriented MWA is conducive to the creation of originating and interacting ba whereas the individual approach helps to build cyber and exercising ba (see Figure 5).

![Figure 4 Management and leadership in relation to the SECI model of knowledge creation (Ormala, 2003)](image_url)

![Figure 5 Maintenance of work ability as a framework for creating a variety of ba](image_url)
Nonaka et al. (2000, 27) gave the following definition of building and energising ba:

**Ba** can be built intentionally, or created spontaneously. Top management and knowledge producers can build **ba** by providing physical space such as meeting rooms, virtual space such as computer network, or mental space such as common goals.

**Ba** should be ‘energised’ to give energy and quality to the SECI process. For that, knowledge producers have to supply the necessary conditions, such as autonomy, creative chaos, redundancy, requisite variety, and love, care, trust and commitment.

The features of energising **ba**, in particular, have a strong emphasis on issues that, following the definitions of this study, fall into the category of leadership. The parts that are labelled here as management, are given less attention in the work of Nonaka et al. Furthermore, the managerial implications of the definitions above are rather weak. The outline presented in this study gives a concrete insight into different activities that companies can undertake to improve the various forms of **ba**. Work community-oriented MWA facilitates dealing with tacit knowledge whereas individually-oriented MWA enhances manoeuvring explicit knowledge.

Reflecting on the conclusions to the literature study presented above shows that intellectual capital is more dependent on employees’ wellbeing than the literature has shown so far. As was already discussed earlier, there are only a few references that discuss this relationship in the first place. Furthermore, literature that would present a more detailed analysis on this theme is even scarcer. This study can be seen as one of the pioneering attempts to scrutinise this relationship further. The emphases found in the data led me to highlight the importance of knowledge creation. Naturally, this is not the same as the whole of knowledge management, but it is still a central element of it. On the other hand, this approach provided a good foundation for defining the importance of employees’ wellbeing.

On the other hand, the conclusions also show that maintenance of work ability should be seen in a slightly different light, if the aim is to truly commit organisations to such development. Even though cost-benefit analyses, for example, are important in showing the savings from reduced sickness-absences etc., yet this is not really what companies are looking for. It is far too easy to belittle costs that amount to only a fraction of annual turnover, for example, not to mention the indirect costs that were also discussed above. Even though public health aspects, for example, are important, the Finnish system directs companies to see this as the concern of the public sector. When employees’ work ability is shown to be in the core of company’s business activities, it can be expected that there emerges a new kind of business-driven interest to start tackling these questions. By discussing the importance of creating new knowledge with respect to an organisation’s performance and showing the role of employees’ wellbeing in this setting, this thesis gives grounds for elaborating the activities aimed at improving employees’ wellbeing. This means that it is not sufficient as such to take care of ageing employees’ health but activities need to be targeted at all age groups and the methods should be selected to meet the development requirements of the specific organisation.

These considerations around the findings of this thesis give further support to the idea that companies should aim at sustainable economical development. The search for quick profits neglects the importance of an organisation’s renewal. It can be argued that
intellectual capital and maintenance of work ability represent renewal from the organisation’s and employees’ points of view. The balanced development of an organisation and its various resources secures the long-term productivity of capital. As was discussed in essay two, this can be seen as the fundamental goal of business activities.

Even though questions of validity and reliability are measurements of objectivity, which is a central issue in quantitative research, there is still a strong call for these considerations also in terms of qualitative research. However, qualitative research is strongly characterised by subjectivity and, therefore, these considerations should be made carefully and thoughtfully. (Daymon – Holloway, 2002; Davies, 1999; Ely, et al. 1991.) In terms of reliability, it is not likely that a different researcher would end up with similar categorisations of the data, even having read the same background material as I did. This is because there is always room for subjective interpretation in qualitative research. I have aimed at describing my approach to both actual research methods and methodological meta-analysis behind these choices in order to show the reader how I have reached my conclusions. With respect to validity, the interview quotes included in research essays are aimed at showing that these themes are actually discussed in the data. On the other hand, the aim of generating conceptual models from the findings in the research essays relates them to the relevant literature.

As with all research projects, this one will hopefully serve more as a beginning of a longer journey than a repository of ready-made answers. Therefore, future research needs can be identified in at least two different directions. Firstly, it would be interesting to sketch out research designs that would implement the findings of this thesis in organisations’ real-life practices. Even though this study has resulted in various conceptual models, they are still rather theoretical by nature. It is easy to imagine that implementing these models to practical development projects requires further elaboration.

Secondly, the research orientation of this thesis was based on qualitative methods and, as has been discussed also in the section on methodology, this has naturally remarkable implications on the results. It would seem reasonable to believe that the models outlined in this thesis provide a sound basis for future research with a quantitative approach. Testing these models as hypotheses would provide empirical evidence from a different point of view to the phenomena central to this study. This research could, for example, be based on a survey aimed at practitioners working with human resources development. If such a research approach were adopted, it would be of highest importance to consider the respondents carefully. As was already discussed above with respect to the qualitative approach, the nature of these phenomena, and especially the links between intellectual capital and maintenance of work ability, are even at best an emerging trend in today’s work life that requires quite a lot from a respondent to be able to tackle these themes in a sensible way. Another approach to quantitative research would be to use some kinds of register data and operationalise these following the models of this thesis. Such an approach could be used, for example, to analyse differences in profitability. It would be an extremely interesting finding, if one were able to show that companies focusing on development of competencies and well-functioning work community in their maintenance of work ability programmes were more profitable than those focusing on improving health, for example.
But to sum up the current findings, this thesis combines different elements of existing knowledge into a new synthesis and also opens up new approaches to the discussion around intellectual capital by showing the importance of employees’ wellbeing and the maintenance of work ability as the framework for improving it. At first glance, the description of the research essays presented above might suggest that they have very little in common and that they do not contribute to a larger whole. However, the conclusion of the essays presented above does indeed wrap up the elements into a comprehensive synthesis. This compatibility of these frameworks suggests that the general adoption of the maintenance of work ability framework into Finnish work life may have contributed to the considerably favourable economical development in Finland during the 1990s.
References


Juuti, P. (1998). ”Verkosto- ja tiimiorganisaatioiden menestyksen ratkaisee niiden kulttuurin yhteistyökykyisyyys [The cooperativeness of the culture is decisive for


from and organisation culture point of view. (in Finnish)]. Työterveyslaitos, Psykologian osasto: Vantaa.


Essays


RECONFIGURING KNOWLEDGE MANAGEMENT –
COMBINING INTELLECTUAL CAPITAL, INTANGIBLE ASSETS
AND KNOWLEDGE CREATION

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Reconfiguring knowledge management – combining intellectual capital, intangible assets and knowledge creation

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Abstract

Intellectual capital, intangible assets and knowledge creation are all concepts that are strongly linked to the phenomenon of knowledge management. Yet they have only been parallel to each other. This controversy between different approaches has also resulted in vague definitions of knowledge management. This paper will critically discuss the definitions of these concepts. The analysis shows that different concepts actually focus on different angles of the topic. Based on this, a model will be built that ties all of them into a unitary entity. At the same time, this model gives a reconfigured definition of the concept of knowledge management.

Article Type: Research Paper
Keyword(s): Intellectual capital; Intangible assets; Knowledge management; Creative thinking.

1. Introduction

The logic of business is shifting from mass-production to knowledge-intensiveness. This progression applies to both modern industries, such as information and communication technology, and more traditional ones, such as the forest industry. The most important theoretical constructions to tackle this timely issue are the concepts of intellectual capital, intangible assets, knowledge creation and knowledge management.

Even though intellectual capital, intangible assets and knowledge creation are principally targeted at more or less the same topic, they are, at best, only parallel to each other. For example, the knowledge creation approach, especially scrutinized by Nonaka and his colleagues, has not been linked to the other two of the above stated discourses, even though Nonaka and Takeuchi (1995) has been acknowledged as the prime book in the field of knowledge management. A distinct definition of the concept of knowledge management is also lacking. This paper will explore definitions of these focal concepts in order to consolidate them into a reconfigured model of knowledge management.

In the next three sections, the current definitions of the concepts will be presented. These considerations lay the foundation for, in section five, deriving a model that defines knowledge management by analyzing,
from a fresh perspective, the relationships of the concepts central to this study. Finally in the sixth section, the implications of the model presented in this paper will be discussed.

2. Intellectual capital

Edvinsson and Malone (1997) discuss the significance of intellectual capital to a company by comparing it to a tree. When looking at the tree, it seems easy to determine how well it is doing. By this superficial judgment, however, the fact that one-half of a tree's mass is actually in its roots is missed. Furthermore, it is the condition of the roots that defines how well a tree performs in the future. Similarly, financial information given by traditional bookkeeping reports creates only a partial picture of a company’s situation. The information given is only able to grasp business activities that have occurred in the past. For current bookkeeping methods, intellectual capital is invisible as the roots of a tree are to a person standing on the ground. Yet it is this hidden part that determines the future success.

Traditional accounting actually mistreats investments in intellectual capital. Viewed as costs, they are written down as short-term expenses, even though they should be seen as essential investments from the new value creation perspective, which relies heavily on knowledge-intensity. Intellectual capital is complementary, not subordinate, to financial information. Either, it can take a long time to create financial benefits from intellectual capital, or the changes may be so rapid that traditional accounting is incapable of grasping them. Financial results should actually be seen as part of the broader IC statement, as it is just one component in a larger attempt to analyze a company's value (Lev, 2001; Edvinsson and Malone, 1997; Sveiby, 1997).

Intellectual capital is traditionally defined as consisting of three parts covering the human aspects, intra-organizational structures and the external environment. The debate around intellectual capital has been active for some ten years. Nevertheless, there is still no common consensus over the concept (see Sullivan, 2000; Sveiby, 1997). Intellectual capital and intangible assets are most often used to describe this phenomenon. Yet some authors prefer the term “intangible resources” (see Johanson and Skoog, 2000). According to this view, the term “intangible assets” leads thoughts too strongly to the balance sheet and the mediated picture is too static in nature.

In this study the three dimensional definition for intellectual capital that has been adopted are labeled human capital, internal structures and external structures. These labels are similar to Sveiby’s (1997) framework with the exception that the competence of personnel is replaced by human capital, as used by, for example, Edison and Malone (1997). This modification is based on the reasoning that human capital is seen to be a broader issue than individual competence. On the other hand, external structures is a broader concept than customer capital used by Edvinsson and Malone. The use of the concept “internal structures” makes it easier to distinguish the difference between intra- and extra-organizational entities than Edvinsson’s and Malone’s structural capital.

No matter what definitions or concepts are used, the essence of the discussion around intellectual capital is the ability to give a holistic view on organizational development. If the three elements are seen as separate from each other, the concept “intellectual capital” has nothing new to offer. Different development activities directed to human capital have a very long history; the scientific management as a whole can be seen as an attempt to strengthen internal structures and the evaluation of customer satisfaction etc. also has a very long history. Therefore, the true contribution of intellectual capital is to provide a framework that makes it possible to view all of these dimensions in relation to each other. As the value platform model presented in Figure 1 shows, it is the intersection of all three dimensions that forms the basis for value creation (Saint-Onge et al. in Edvinsson and Malone, 1997). Even when two dimensions are very strong, the weak or inadequately directed dimension disrupts the value creation process. In the value platform model, knowledge management can be seen as a force that pulls different dimensions into closer interaction with each other. For example, the business re-engineering school, that was highly endorsed in its time, focused solely on organizational development, that is, internal structures, and ignored human resources, in particular (Eisenberg, 1997). Downsizing of the organization was, therefore, often used as a tool for attaining increased effectiveness. However, this creates severe uncertainty and also a competitive atmosphere in the organization. When a work community deteriorates, the vitality of the organization also crumbles. The holistic perspective of intellectual capital makes it
possible to attain sustainable economical development in organizational development activities as all three dimensions are considered in a balanced way.

Vision and strategy are essential for intellectual capital because it can only exist and be developed in the context of an organization’s strategy. In other words, intellectual capital does not exist without a purpose and an approach. Vision is a shared, rousing and comprehensible goal, which describes what an organization wishes to be in the future. Possibly the state defined in a vision is never even achieved, but this image has an important role in steering the activities and directing the organization’s energy. Strategy concretizes the goals set in the vision and describes the methods to be used in attaining the goals set by the vision (Ranki, 1999). The vision sets a benchmark against which the organization may measure the value of its intellectual capital; that is, whether an item of intellectual capital is helping a company move towards its vision or not (Sullivan, 2000). Therefore, besides setting the direction for the organizations’ activities, vision also sets the grounds for evaluating the successfulness of the strategy.

Furthermore, the management of intellectual capital can be analyzed by strategically focusing on different dimensions of intellectual capital. The adopted strategy for managing intellectual capital varies considerably depending on the company’s branch and strategic decision-making processes. A common feature, however, is that a company’s strategy often relies heavily on one particular dimension of its intellectual capital, which it supplements with a second dimension, while largely overlooking the third. This setting reveals both the strengths and most essential areas of development in intellectual capital. The various potential combinations are highlighted by a matrix presented in Table I. The matrix allows a total of six different combinations, because the dimensions cannot simultaneously have two roles[2] (Hussi, 2001; Hussi and Ahonen, 2002).

For “successful networking” companies, the most valuable strategic intangible asset is the ability to manage external networks. “Learning systems” companies build their intangibles strategy on competencies related to production process efficiency. The activities of “competence without boundaries” companies are essentially based on the innovation potential of the competent personnel in an environment of loose regulation compared to foreign competitors. For companies in “the network of excellencies” group, a competent personnel and external networks are necessary for meeting the challenges of the tight regulation that dictates the activities of these companies (Hussi, 2001; Hussi and Ahonen, 2002). It is characteristic of “systemized competence” companies that the work tasks of the highly competent personnel are well coordinated internally. Process efficacy is the category for companies that produce added value especially on already existing set-ups.

Organizational changes often become difficult due to an inadequate understanding of the complex whole, that is, dynamic system effects. It is the ability to develop an organization in a holistic way that makes it possible to achieve really significant improvements in productivity. In pursuing the holistic approach to organizational development, it is important to also realize that companies differ in their environment, history, knowledge resources, management and competitive decisions. Interpretations of the future differ in a similar way. This implies that companies that superficially appear similar do, in fact, require highly differentiated strategies for managing their intellectual capital (Mouritsen et al., 2000).

The measurement of the intellectual capital’s value may be either qualitative or quantitative. Indicators are often defined in such terms that they are not as black-and-white as normal quantitative measures. Non-financial benchmarks are crucial, because a major feature of intellectual capital is that it values such activities that may show up in financial results only after many years. Customer loyalty and long-term developments of human capital are examples of this (Edvinsson and Malone, 1997).

### 2.1. Human capital

Human capital is defined as the individual’s knowledge, experiences, capabilities, skills, creativity and innovativeness (Edvinsson and Malone, 1997). These elements are connected to each other and collectively contribute to success in work (Ranki, 1999). Sveiby (1997), who uses the concept “employee competence”, defines it as a capacity to act in different situations to create both tangible and intangible assets. While capabilities are seen as a central element in definitions of human capital, the individual's
individual's general capability. Brooking (1996) has briefly mentioned health as one indicator of human capital, but no further elaboration has been made on this topic. In this study, one of the reasons for using human capital instead of Sveiby’s (see Sveiby, 1997, p. 10) competence of the personnel is that an individual’s health can be included in the previous one. However, this finding needs further research to analyze the relationship more thoroughly.

Creativity is a culture-bound ability to comprehend connections between things and change them in a qualitative, and even discontinuous, way in order to create ideas with added value. Ideas with added value, that is innovations, are such that they increase knowledge and create new ways of thinking. The ability to create knowledge and also exploit it is essentially characteristic to all business activities. The added value of an idea is always determined by the customer (Salmenperä et al., 2000).

The ability to perceive changes in the operational environment is also included in this category (Edvinsson and Malone, 1997). Learning is an individual’s development and adaptation to a changing environment. These changes require the ability to control immediate work tasks, as well as the ability to improve functioning and a readiness to develop even qualitative features of work (Salmenperä et al., 2000). Attitudes are related to this readiness, because they show what kind of stand a person takes in his or her tasks (Mayo and Lank, 1994).

The fact that a company cannot own its human capital distinguishes this dimension of intellectual capital from the other company resources (Edvinsson and Malone, 1997). Uncertainty about an employee’s commitment to the organization reduces the organization’s willingness to make these investments, especially if, as in many branches, the required skills are non-specific and transferable (Albert and Bradley, 1997). Yet, a competent personnel is the key in a company’s endeavor to realize and develop its business ideas (Hansson, 2001; Sveiby, 1990). Investments in personnel are as crucial for knowledge-intensive companies as an industrial enterprises’ investments in tangible assets (Sveiby and Lloyd, 1987).

2.2. Internal structures

Internal structures include patents, concepts, models, computer and administrative systems, and organizational culture (Sveiby, 1997). Edvinsson and Malone (1997) define internal structures, or structural capital as they call it, as the context, empowerment of employees, structures supporting human capital, organizational capital, innovation capital and process capital. Empowerment of the employees is based on distributed decision-making and collaborative leadership models. These require employees’ increased commitment to the organization and its goals. Highly committed employees are willing to take more responsibility for the planning and development of their tasks (Sarala and Sarala, 1996). Commitment can be created by supporting the employees’ feeling of responsibility for the organization’s business and providing them with sufficient information, skills, resources and authority to make decisions (Juuti, 1992).

Structures that support human capital include, for example, recruiting capabilities, development activities, motivating strategies and organizational culture. Organizational capital consists of systems and tools, enhancement of knowledge flows and organizational competence. Innovation capital includes a company’s renewal capability, results from innovativeness protected by immaterial property rights, as well as results that can be used to create new products and services and bring them quickly to the markets. Process capital is practical knowledge that includes definitions and improvements of work processes (Edvinsson and Malone, 1997).

An organization’s knowledge base cumulates in numerous daily decisions and experiences. These are stored in work processes, instructions, forms etc. resulting in organizational learning. Organizational culture can be seen as a consequence of organizational learning as it forms a shared framework for defining and solving problems (Ranki, 1999). Schein (1992) connects organizational culture with leadership. Neither can be understood without the other, but they are different sides of the same coin. Organizational culture is the deepest level of fundamental presumptions and beliefs. It unconsciously influences the behavior of the organization’s members. It defines the organization’s conception of itself and its environment in a fundamental way. This conception has evolved while solving problems in relation
to internal and external integration. It has turned out to function well enough to be taken as justified and to be transferred to the new members as the organization’s way of thinking, perceiving and feeling the problems.

It is the nature of internal structures that they cumulate as an organization grows and develops (Sveiby, 1990). Too tight social norms, organizational values and business orthodoxies enhance a dangerous equilibrium and, thus, nullify the benefits of diversity. Too strictly standardized functioning cannot meet the unexpected changes. Such rigidity is dangerous for an organization because it hinders the organization’s capacity to react to information obtained from different nodes (Pascale et al., 2000).

According to Edvinsson and Malone (1997) internal structures include all the substance that a company has created by its human capital or otherwise acquired for the organization. Organizational structure, different documents and all immaterial property rights (patents, trademarks, copyrights etc.) are included in the internal structures. Unlike human capital, the company owns its internal structures and, therefore, it is also able to sell specific parts of it, such as databases etc. This definition, that includes immaterial property rights in internal structures, obscures the intellectual capital related logics of value creation. This notion will be discussed further in Figure 2.

2.3. External structures

The external structures include relationships with customers and suppliers, brand names, trademarks and the company’s reputation or image (Sveiby, 1997). Edvinsson and Malone (1997) use the concept “customer capital”. According to their definition, it consists of the strength and loyalty of the customer relationship. Such characteristics as satisfaction, durability, price-sensitiveness and good financial performance of long-term customers are related to this category. Customer capital can be created by committing the customers to the company's activities using time and resources. Trust is also a significant element in this process. What is most important is the enduring relationship between the seller and the customer. These relationships are judged based on penetration, coverage and loyalty measured as a customer’s probability of continuing the partnership (Stewart, 1998). This study uses the concept “external structures” because stakeholders like subcontractors, other organizations, consultants, training institutions and the public sector can also included in this.

Interdependence is claimed to be a characteristic of technology-based firms (Yli-Renko, 1999). Even though networking is seen as beneficial to a company, it has multifaceted effects on the company. Companies need to interact continuously in order to learn from other network members and develop their own status and position in the network. Breaking up a commitment to some relationships and building up new ones can result in significant costs. Reluctance to accept these costs reduces a company's mobility in its relationships and may hinder its innovativeness. Furthermore, through interaction a company should try to learn to understand the functioning of the network “from the perspective of others” in order to learn how it influences the network and how it is being influenced by it. Finally, companies should aim at acquiring control over the network, but it should not be total or the network will lose its dynamics (Håkansson and Ford, 2002).

Different kinds of networks have always existed, but they have been more or less informal. The novelty in the new networking is that companies operate in these activities in an objective-oriented way. One essential reason behind this development is the reduced costs of information technology that makes information sharing cheaper and, at the same time, more efficient (Stewart, 1998). Due to the increasing need for networking, organizational boundaries lose significance. Collaboration leads co-operation systems, such as virtual organizations, that last at least for a while. Therefore, the competition is no longer simply between different companies, but also different value chains. Value chains consist of suppliers, middlemen, service providers and manufacturers. Information technology can be used to improve the functioning of the value chain both inside organizations and between them (Salmenperä et al., 2000).

The significance of relationships is often ignored in companies' strategic planning. This is especially true for traditional approaches to strategy development, which oversimplify the networked context of business. However, stressing the importance of relationships does not mean that companies should aim at being
“nice” to their partners in the same manner as, for example, in inter-personal relationships. External relationships have a historical load in both good and bad. Long lasting relationships often create trust among partners. Historical load also puts inertia in a company’s willingness to create new connections with previously unknown suppliers. Membership in different networks also shapes companies as their alternatives are largely tied to changes in counterpart companies. As the networked context is so complex, companies cannot rely on the effectiveness of a straightforward strategy over the long-term. Strategy development is very much about coping with changes in the business context (Ford et al., 1998.)

As a concluding remark in the discussion around intellectual capital, it can be stated that even though intellectual capital does provide a valuable insight into contemporary business, its relation to value creation is still quite blurred. The primary statement of the value platform model that value is being created in the intersection of the three dimensions raises a question of what is this value. This question is addressed in the next section as intangible assets are placed in a general view of an organization.

3. Intangible assets

According to Ahonen (2000), intangible assets can be divided into two classes, namely generative and commercially exploitable intangibles. The rationale for this distinction is that definitions of intellectual capital tend to obscure the causal mechanism behind the intellectual capital based value creation. The commercially exploitable intangibles consist, for example, of cost efficient production, immaterial property rights, customer capital, excessive demand and reliable management. These form the basis for the expectations of capital markets. Organizations can acquire commercially exploitable intangibles either through company acquisitions or by generating them themselves. The ability to generate commercially exploitable intangibles requires processes and assets, which include human capital, internal structures and external structures. These generative intangibles describe the capacity of a firm to produce commercially exploitable intangibles.

The role and significance of intangible assets is displayed in Figure 2. The overall goal of business is long-term productivity of the invested capital. The company seeks this by executing its business ideas using all its resources, tangible as well as intangible, under the control of leadership. The financial markets’ expectations of the company’s performance are reflected in the market value of the company. In reality, the financial markets turn out to base their estimates on relatively limited information, as they tend to use mainly information on leadership, management and tangible assets and even in the best cases scant information on intangible assets (Hussi, 2001; Lee, 2001). This may partially be due to a lack of available information. This problem has been approached, for example, by setting up cross-European research initiatives, such as the MERITUM project, to modify generalized guidelines for reporting on intangibles (see, for example, the MERITUM project, 2002).

When considering the management of intangible assets, it is essential to understand that none of the components of intangible assets per se is sufficient for successful performance; the separate items need to be combined into the best possible balance. A company’s current performance (and its market value if listed on stock markets) depends essentially on its commercially exploitable intangibles. Moreover, continuous renovation in response to the company’s constantly changing environment is only possible through a balanced management of its generative intangibles to intensify the intersection of human capital, internal structures and external structures (Hussi, 2001; Hussi and Ahonen, 2002).

This classification of intangible assets is closely related to the value platform model presented in Figure 1, but it focuses more closely on the causality of the value creation. Whereas the value platform model only states that value is created in the intersection of the dimensions, this model reveals a realization of future potential as a commodity and, thus, further reveals the mechanics of intangibles based revenues. Commercially exploitable intangibles are the basis for current cash flow, whereas generative intangibles are the source for renewal and the creation of future commercially exploitable intangibles. However, this model does not describe how the transformation takes place. There is a black-box feature in this setting, because the mechanics of commercialization are taken as given. Therefore, further specification is still needed. In the next section the knowledge creation approach as the process resulting in this change will be discussed.
4. Knowledge creation

Sveiby (1997) argues that knowledge has four characteristics. First, especially practical knowledge is, to a high degree, tacit by nature; that is, it is difficult to explain in words. Second, knowledge is action-oriented and characterized by a process-like nature. Reality is understood by categorizing it in a fashion that has turned out to be applicable in the past. An entity is perceived by analyzing details of it and these elements are integrated in reflection on previous experiences. Third, knowledge is supported by rules. Previous experiences cumulate as mindsets that help us perform different activities effectively “without having to stop to think about what we are doing”. Practice is about refining these rules. Finally, knowledge is constantly changing. Externalization of tacit knowledge makes it static and, thus, possible to reflect, distribute and critique it. Knowledge is increased through these actions. Thus, in short, knowledge can practically be defined as a capacity to act.

Nonaka et al. (2000) define knowledge as a true justified belief with the emphasis on “justified”. Therefore, relative, dynamic and humanistic dimensions are characteristic of this definition. The dynamics of knowledge derive from its origins in social interaction. The context-specific nature distinguishes knowledge from mere information, because the meaning is embedded in the context.

Information becomes knowledge when it is interpreted by individuals and given a context and anchored in beliefs and commitments of individuals (Nonaka et al., 2000).

There are two different kinds of knowledge, that is, tacit and explicit (Polanyi, 1958). Tacit knowledge is personal and, therefore, difficult to formalize, communicate and share with others. Tacit knowledge consists of a technical dimension often referred to as know-how and a cognitive dimension that includes schemes, mental models and beliefs, in short a conception of reality. Explicit knowledge can be conceptualized and stored in information systems. Western thinking has concentrated on explicit knowledge. This tradition stems from the Cartesian dualism, which makes a clear distinction between mind and matter and, accordingly, body and mind. In the Japanese thinking tradition, knowledge is traditionally seen primarily as something not easily visible and expressible, that is, tacit by its nature (Nonaka and Takeuchi, 1995).

Successful knowledge companies create sustainable value through the creation and use of knowledge and know-how. The essence of knowledge creation is the interaction between tacit and explicit knowledge rather than tacit or explicit knowledge acting separately. It is this dynamic interaction that generates innovations and, furthermore, organizational knowledge. Organizational innovativeness is not merely the processing of information prevailing in external realities, but companies also create new knowledge and information by redefining internally both problems and solutions already found. Knowledge is created through interaction both internally between the organization’s members and externally in relation to the environment. In this interaction process all participants also get to develop themselves (Nonaka and Takeuchi, 1995).

In Nonaka and Takeuchi (1995) the interaction between tacit and explicit knowledge has been expressed by means of the SECI model, which consists of four different modes of knowledge conversion (socialization, externalization, combination and internalization). Knowledge creation is a spiraling process in which different modes of knowledge conversion follow on each other. This process is called the epistemological level of knowledge creation. The SECI process is shown in Figure 3.

In socialization, tacit knowledge is converted into tacit “by sharing experiences”. Since it is the nature of tacit knowledge that it cannot be expressed by spoken language, the conversion has to take place through observation, imitation and practice. The starting point for socialization is building the field of interaction that facilitates the sharing of experiences and mental models. Organizational redundancy is an important mediator of socialization, because it exhorts dialogue and communication between the organization’s members. This redundancy is created, on the one hand, by having group members with sufficiently different backgrounds and, on the other, by multiple sources of information. Managers generate creative chaos in the team’s work by questioning the ambitiousness of goals. In order to turn chaos into a creative state, the organization has to institutionalize the constant communal reflection of its functioning. Team members are also expected to have a significant level of autonomy in pursuing the
commonly agreed goal. The resulting form of knowledge is emphatic (Nonaka and Takeuchi, 1995). Socialization is strongly supported through direct interaction with suppliers and customers (Nonaka and Konno, 1998).

In externalization, the tacit knowledge is converted into explicit concepts. It is characteristic of externalization that it is the activity of a group. In externalization, knowledge takes a conceptual form. During the externalization process, when tacit knowledge is made explicit, the shared perception is articulated into concepts in an ongoing dialogue. It is through collective reflection that words develop into phrases and further to crystallized concepts. The means of this conversion are the use of different metaphors, analogues, concepts, hypotheses and models in a sequential order. Expressing tacit knowledge via metaphors makes it possible to observe or intuitively come up with symbolic comprehension. Metaphors are intuitive by their nature. They are based on holistic imagination and are not aimed at pointing out the differences. Analogies, on the other hand, are based on rational thinking. They aim at showing structural or functional similarities as well as differences. Externalization is an extremely important phase from a knowledge creation point of view. If the knowledge to be shared has no explicit form, it is difficult to distribute it across the organization (Nonaka and Takeuchi, 1995). One of the important features of the SECI process is externalization of highly professional or highly personal tacit knowledge that is attained in the socialization phase from external relationships or specialists, and converting it into an easily understandable form (Nonaka and Konno, 1998).

Combination is about converting explicit knowledge into explicit knowledge. In this mode both the new concepts generated through the externalization and already existing explicit knowledge are organized into larger knowledge structures, that is systemic knowledge (Nonaka and Takeuchi, 1995). In combination, explicit knowledge is incorporated into more complex and systematic sets of explicit knowledge. The combination may also include the breakdown of concepts to operationalize them as new systemic explicit knowledge is created. The explicit knowledge needed in this phase can be gathered either from inside or outside the company (Nonaka et al., 2000). It is characteristic of the combination phase that explicit knowledge being processed can be directly disseminated by presentations or meetings (Nonaka and Konno, 1998). Different computerized networks and databases can turn out to be highly facilitating in disseminating explicit knowledge resulting in combination throughout the organization (Nonaka et al., 2000).

Internalization is the mode in which explicit knowledge is converted into tacit. This operational knowledge takes place through learning by doing. Internalized knowledge becomes part of the individual's cognitive resources. This process is facilitated by verbalized or visualized documents, manuals or spoken stories that result from combination. When most of the organization's members possess certain tacit knowledge it becomes part of the organization's culture (Nonaka and Takeuchi, 1995). Explicit knowledge shared throughout the company is converted into tacit knowledge by individuals. Reflective revision of, for example, documents can enrich the organization's members' tacit knowledge base. Shared mental modes or technical know-how that have been assimilated into organization's members' tacit knowledge bases form a valuable asset for the company (Nonaka et al., 2000). The process of internalization is the link that makes explicit knowledge, as expressed in strategies, innovations and improvements, a part of the organization’s daily functioning (Nonaka and Konno, 1998).

The spiral of the SECI process becomes larger in scale as it expands both horizontally and vertically across the organization, that is, transforms into new ontological levels. Sectional, departmental, divisional and even organizational boundaries are transcended in this process. Knowledge created by one organization can trigger multiple similar processes far beyond the originating organization (Nonaka et al., 2000). The ontological dimension of knowledge creation occurs when knowledge transcends to a different organizational level and begins anew. This shift can take place intra-organizationaly or even between organizations. Intra-organizational transcendence of knowledge takes place, for example, when knowledge is moved from the divisional to the organizational level. Knowledge transcendence between organizations mobilizes stakeholders’ knowledge in a dynamic interaction. In short, the ontological dimension refers to the transformation of knowledge created by individuals into the knowledge of groups and organizations (Nonaka and Takeuchi, 1995).

These two dimensions, the epistemological and the ontological, constitute knowledge creation (Nonaka and Takeuchi, 1995). Knowledge creation is a continuous, self-transcending process through which the participants' boundaries of self are reshaped by acquiring a new context, a new view of the world and
new knowledge (Nonaka et al., 2000). The role of the organization in knowledge creation is to provide the context that facilitates group activities. At the same time, it provides both a setting for knowledge generation on the individual level and knowledge accumulation on the organizational level (Nonaka and Takeuchi, 1995). An individual’s knowledge is inevitably specialized and domain-specific. Collective knowledge discusses the possibilities of distributing and sharing knowledge among the organization. It can be either a “stock” of knowledge stored as hard data or a “flow” emerging from interaction. Collective knowledge exists between people rather than within individuals (Lam, 2000).

The context in which knowledge is embedded has been conceptualized as ba (see for example Nonaka, 1998; Nonaka and Konno, 1998; Nonaka et al., 2000). In a ba changes take place at both micro and macro levels, as both the participants and the ba change (Nonaka et al., 2000). Therefore, the ba provides a platform for advancing individual and collective knowledge. It is a context that harbors meanings and is, accordingly, seen as a shared space that serves as a foundation for knowledge creation. The concept of ba integrates physical, virtual and mental spaces into the individual’s conception of his position as part of the surrounding environment. To participate in a ba means facing and outreaching one’s own limited perspective or boundary. (Nonaka and Konno, 1998.) A ba exists at many ontological levels and these may be connected to form a greater ba. Individuals form the ba of different groups, which, in turn, form the ba of an organization and these again form the ba of a market environment and further society as a whole (Nonaka et al., 2000).

There are four types of ba that are related to the different phases of the SECI process: originating ba, interacting ba, cyber ba and exercising ba. Originating ba is the “space” for sharing feelings, emotions, experiences and mental models between individuals. Originating ba creates a basis for the emergence of care, love, trust and commitment. Organization issues that are closely related to originating ba are knowledge vision and culture. The current trend of emphasizing openness in an organization's functioning and active orientation towards stakeholders also create stronger links to harness extra-organizational tacit knowledge into the knowledge creation process. A company should, however, take care not to dominate a ba that is jointly created with the customers (Nonaka and Konno, 1998). The difficulty of originating ba relates to the difficulty of managing it. Originating ba is rather ecological and autonomous by nature. It depends heavily on the organization’s culture and leadership style (Nonaka, 1998).

The creation of interacting ba can be more purposeful and conscious. Getting the right mix of people with the right mix of knowledge and abilities to work on the externalization of tacit knowledge is the key element of interacting ba. Through dialogue participants share the mental models of the others and reflect them as their own. This process brings forth commonly accepted explicit terms and concepts (Nonaka et al., 2000; Nonaka and Konno, 1998).

Cyber ba can take place in virtual environments because the relevant knowledge has already been captured and represented in a way that does not demand face-to-face human interaction to share. Using information technology makes combination and systemized knowledge dissemination across the organization most efficient as limitations of time and space can be transcended (Nonaka et al., 2000; Nonaka and Konno, 1998).

Exercising ba facilitates the internalization of explicit knowledge. Learning through on-the-job-training and other continuous cultivation of oneself means embodying explicit knowledge that is communicated, for example, through virtual media. Exercising ba synthesizes transcendence and reflection through action rather than by analysis (Nonaka et al., 2000; Nonaka and Konno, 1998).

An organization capable of innovating systematically manages its knowledge creation process. Creating a variety of ba moulds knowledge creation into a spiral as shared mental space expands effectively when moving further along the ontological dimension, while simultaneously helping individuals to expand their cognitive limits (Nonaka, 1998). A top-down management approach gives only top management sufficient circumstances for creating new knowledge. On the other hand, it is typical of bottom-up management that interaction between the organization's members is rare. This results from seeing autonomy as the main principle and it is the individuals that are essentially the creators of knowledge. The ways of working are more like those of entrepreneurs instead of co-operation. Therefore, middle management has an essential mediating role between top management and shop floor personnel (Nonaka and Takeuchi, 1995). Yet the role of the leaders is central because it is their valuation that provides a platform for the
dynamics of knowledge creation. They can manage the emergence of knowledge by providing sufficiently challenging strategic goals and personal commitment. The success of knowledge creation depends on responsibility, justification, financial backing and care offered by the leaders (Nonaka and Konno, 1998).

5. Synthesizing intellectual capital, intangible assets and knowledge creation

Knowledge management has become a topical issue in business administration studies. However, excluding the attempts to create evaluation and reporting methods, there has been relatively little effort to clarify the very content of the concept of knowledge management. Ikujiro Nonaka published the pioneering book *The Knowledge Creating Company* together with Hirotaka Takeuchi in 1995. This book has been taken as the cornerstone of knowledge management as knowledge transfer is seen as the essence of knowledge management (Sveiby, 1997). Furthermore, Nonaka et al. (2000) provide a comprehensive model to description of dynamic knowledge creation.

In the unified model of dynamic knowledge creation (Figure 4) the distinction between *ba* and the knowledge assets is not clearly defined. *Ba* and knowledge assets are both dynamic concepts. Questions arise from this setting concerning the relationship between the two concepts. First, how can *ba* be separated from knowledge assets, as it actually is one of the knowledge assets? Second, the model contains some linkages (such as knowledge assets moderating the interaction between *ba* and the SECI process) that are not easy to understand.

The simultaneously determined nature of knowledge assets and the SECI process in Nonaka et al. (2000) construes a structure that is lacking economic impetus. In the model the knowledge assets form the "raw material" to be converted in the SECI process, which, in turn, result in new knowledge assets. This outline is not able to reveal the logic of value creation, which remains a black box.

The Nonaka et al. model, however, forms a useful basis for describing the various elements of knowledge management and intellectual capital. It also presents many important connections between these elements. It is, for example, one of the most illustrative presentations that set knowledge vision in a fundamental position in this discourse. It is rather often taken as given that strategic planning is the primary element in defining a company's intellectual capital, and no further clarifications have been made to make the grounds visible. Similar articulation about the importance of knowledge vision can be seen in Danish work around intellectual capital statements (see, for example, Mouritsen et al., 2000).

Knowledge-based resources involve both static and dynamic features. Therefore the concepts of both intangible assets and intellectual capital should be based in the same model (see Figure 5). In this way, it is possible to take advantage of the static nature of the former one and the dynamics of the latter. Even though generative intangible assets consist of three elements that are identical to those of intellectual capital, there is still something that is only present in the latter. This feature is the dynamic processes. Without them the generative the intangible assets are merely static stocks of assets. It is the dynamic processes that create interaction between these elements and, thereby, constitute intellectual capital.

Knowledge vision is a roadmap that gives direction to the organization’s knowledge creation. It is a tool articulated and communicated by the top management for synchronizing the entire organization. It is not tied to existing products, organizational structure or markets, but transcends them all. It also provides a frame of reference in defining the value of the knowledge created by the company (Nonaka et al., 2000). Knowledge vision is, thus, the logical starting point for all activities related to knowledge management. To put it briefly, it forms the basis for defining what are the company’s generative intangible assets, how the dynamics of the SECI process should be directed and, in the sense of context, or *ba*, where does this take place.

Defining generative intangible assets is fundamental, because it describes the company’s resources for creativity. The three-dimensional definition used in this study outlines the broad classification of these resources. This classification is applied to a specific organization by reflecting it in the company’s strategy. An example of a study that focused on identifying intangible assets was referred to above (Hussi, 2001; Hussi and Ahonen, 2002; see also Table 1).
Building and energizing ba means developing the context in which knowledge creation through the SECI process takes place. According to Nonaka and Takeuchi (1995), middle management has an essential role to play in breaking down the visionary discourse of the top management and in applying it to the chaotic every-day life of the front-line personnel. In the turmoil of maintaining the SECI process, middle managers feed the process by new concepts and images that guide knowledge creation synchronically with the shared goals outspoken in knowledge vision (Nonaka et al., 2000). Therefore, it can be stated that they are the key players in maintaining the SECI process. At the same time, they also contribute by reshaping the conceptual framework that is used to interpret the experiences and results of knowledge creation. They, therefore, also provide indispensable insights for developing the knowledge vision further.

The Danish approach discusses management challenges that are about defining critical relationships that link user value with knowledge resources. The consequences of using knowledge resources are, in a certain way, assessed in relation to expected outcomes and, therefore, are strategic formulations of a company’s future efforts (Mouritsen et al., 2000). The management challenges approach adopted by the Danes is very closely related to the strategic alternatives of a company and, thus, represent the directing link presented as lead SECI. This is not the task of the middle management but more of the executive officers.

It is the generative intangibles that stand out as the input for the SECI process and the main output is in the form of commercially exploitable intangibles. In this way organizational innovativeness, which takes place through the SECI process, is turned into a form in which value extraction is possible, that is output has commercial value. Some outcomes may also be in the form of new generative intangibles, for example, as tacit knowledge is shared between individuals through socialization and, thus, new human capital is created.

Justification means finding the basis for agreement (Nonaka and Konno, 1998). It requires evaluation of the relevance and usefulness of the knowledge produced in the SECI process. Even though the mechanisms for winnowing out the relevant results are usually created by the top management, they have to be explicitly known throughout the organization (Nonaka and Takeuchi, 1995). The resulting commercially exploitable intangible assets are linked back to knowledge vision as successfulness in some areas might encourage an organization to develop its strategic positioning by focusing on activities in which its strengths lie or then again leveraging strengths into new branches of industry.

A coherent knowledge management strategy can be seen as an attempt to verbalize the system labeled intellectual capital in Figure 5. In the Danish framework, the knowledge narrative has a central role. It can be seen as an approach to describe the intellectual capital of a company as a whole. The aim of a knowledge narrative is to explain how the company’s products or services benefit the users and how they improve their situations. The knowledge narrative is used to explain the knowledge management strategy chosen by the company and the rationale for choosing this specific strategy. In short, the knowledge narrative helps to define the basic values of the company – it’s raison d’être. For example, a plastic bag that is created for medical purposes can be shown to have a significant role in improving the quality of life of a disabled person (Mouritsen et al., 2000).

Knowledge narrative is not merely an analytical tool, but a meaningful story in which analytical elements are related to each other in a coherent entity. A slogan consisting of a couple of words is not strong enough to explain the value creation of an organization. Describing the use value, user’s situation, the particular characteristics of the product or service, fundamental conditions of production and the management challenges are the elements that are required for a coherent knowledge management strategy. The picture given by the knowledge narrative explains what the company does and also presents an idea of what it wants to be (Mouritsen et al., 2000).

The reconfigured model of knowledge management meets the challenges placed on the unified knowledge creation model (Nonaka et al., 2000). The problems of the relationship between ba and knowledge assets are avoided by redefining the role of ba. Second, the whole idea of the reconfigured model is to gather different elements of the same discourse into the same model and, thus, inseparably see the knowledge creation approach in relation to intellectual capital and intangible assets. Finally, the business logic is distinctly added to the model.
6. Discussion

The Nonaka and Takeuchi (1995) book *The Knowledge-Creating Company – How Japanese Companies Create the Dynamics of Innovation* has an established position as one of the corner stones in knowledge management literature. On the other hand, knowledge management is seen as an impartial element of intellectual capital. The model presented in this paper represents an attempt to combine the pioneering work of Nonaka *et al.* with the broader intellectual capital discussion. The conceptual categorization of the reconfigured model of knowledge management represented in Figure 5 describes the relation between intellectual capital and intangible assets. In this setting the critique of the concept of intangible assets is turned into a strength because the static nature of the concept is essential in the outline of the model. This classification is built to unravel the black-box phenomenon that easily takes place in discussions around intellectual capital. Generative intangible assets are an input that is modified by the dynamic processes. The definitions for these processes are outlined by Nonaka *et al.* (2000). Static resources combined into dynamic processes create the basis for the organization’s future success. The output of this modification takes the form of commercially exploitable intangible assets, which are the grounds for a company’s intangibles related current cash flow. Hence, the model explains the business rationale of intellectual capital.

The managerial implications of this study can be summarized in the statement that the reconfigured model of knowledge management gives as a blueprint for designing concrete steps of value creation. It helps the manager to understand the internal logics of intellectual capital, that is only implicitly present, for example, in the value platform model (see Figure 1). Thus it is possible to develop organization in a way that facilitates knowledge creation. This is undertaken in accordance with the general objectives of an organization that are organized through knowledge vision.

A question might arise whether the concept of intellectual capital has been used inconsistently. Therefore, it is important to point out the relationship between the figures describing the value platform (Figure 1), the intangible assets from a general view of the company (Figure 2) and the reconfigured model of knowledge management (Figure 5). There is no disharmony between the figures; they actually describe the phenomenon in an increasing level of detail. The value platform model is fundamental for understanding the importance of interrelatedness and, thus, the dynamics when discussing intellectual capital. If the compounding elements of this model are analyzed, it can be seen that it does contain both generative intangible assets and the dynamic processes, that is, the definition is similar to that in Figure 5. Reducing the level of abstraction makes it possible to scrutinize the logic of value creation more closely. The focus in Figure 2 is directed to this aspect by outlining the relationship between generative and commercially exploitable intangibles. The dynamic processes are beyond the scope of this figure. Finally, Figure 5 presents both the dynamic processes and the static intangibles and, thus, shows the logics of value creation related to intellectual capital. These three figures sum up as a continuum, through which it is possible to gain an understanding of the economical relevance of intellectual capital.

It is a matter of discussion whether the knowledge vision should be included in intellectual capital. The knowledge vision is located outside intellectual capital because it is something that defines and directs the company’s use of its intellectual capital. Even though the knowledge vision is not included in the definition of intellectual capital, the relationship between intellectual capital and knowledge management is similar to Schein’s (1992) definition of organizational culture and leadership. According to Schein, it is not possible to understand one without the other, but they are more like two sides of the same coin. Even though this issue is an interesting one and will supposedly give rise to discussion among the scientific community of this field, this is still a minor detail in the complexity of this paper. The principal aim of this paper has been to explore the relationship between intellectual capital, intangible assets and knowledge creation, and, thus, create a reconfigured model of knowledge management. It turned out that scrutinizing the perspective of value creation was an applicable approach in building these connections.

Acknowledgements

The author would like to thank Rita Asplund and Guy Ahonen for their helpful comments. The financial support of The Finnish Work Environment Fund is gratefully acknowledged.
Notes

1. The sources for the model were IFAC (1998) and Edvinsson and Malone (1997). According to the latter, the model was created by Saint-Onge, Armstrong, Petrash and Edvinsson. The Figure given here is modified to follow the definition of intellectual capital used in this paper.

2. Originally this categorization matrix was created in the study of nine case companies quoted in the Helsinki Stock Exchange (Hussi, 2001). In that study, four out of six possible combinations were identified, but in this paper the matrix has been supplemented to cover all the alternatives.

Figure I The value platform model[1]

![Figure I The value platform model](image)

Table I Categorization of organizations according to the focus on the dimensions of intellectual capital

<table>
<thead>
<tr>
<th>Secondary intellectual capital</th>
<th>Human capital</th>
<th>Internal structures</th>
<th>External structures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human capital</strong></td>
<td>–</td>
<td>Learning systems</td>
<td>Network of excellences</td>
</tr>
<tr>
<td><strong>Internal structures</strong></td>
<td>Systemized competence</td>
<td>–</td>
<td>Successful networking</td>
</tr>
<tr>
<td><strong>External structures</strong></td>
<td>Competence without boundaries</td>
<td>Process efficacy</td>
<td>–</td>
</tr>
</tbody>
</table>

Figure 2 Intangible assets in the general view of the company

![Figure 2 Intangible assets in the general view of the company](image)
**Figure 3** The spiral of knowledge in the SECI model (Nonaka and Takeuchi, 1995)

**Figure 4** The unified knowledge creation model (Nonaka et al. 2000)
References

Ahonen, G. (2000), "Generative and commercially exploitable intangible assets", in Gröjer, J.E.,


Essay II

MANAGING INTANGIBLE ASSETS – A QUESTION OF INTEGRATION AND DELICATE BALANCE

Tomi Hussi
Guy Ahonen

Managing intangible assets – a question of integration and delicate balance

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Abstract

The relevance of intangible assets for financial performance is getting more widely accepted. There is also some convergence about the conceptual structure of intangibles. What has not been underlined enough yet is the synergic nature of different types of intangibles. In this paper, it is argued, in the light of a case study of nine Finnish companies, that the intangibles form a value chain of generative and commercially exploitable intangibles. Furthermore, it is argued that each company at each time has an emphasis on a certain type of intangibles, sometimes even neglecting others. The paper seeks to propose that it is important to identify the primary intangibles and their current relationships with other forms of intangibles. The management of intangibles is hence a matter of integration and delicate balance.

Article Type: Case study
Keyword(s): Intellectual capital; Intangible assets; Management.

Background

The role of competence has increased strongly in the world of business. Empirical studies show that the so-called knowledge-intensive companies have a market value that is significantly higher than their book value of equity. (Eronen, 1999; Hansson, 1997; Johanson, 1996; Johanson and Skoog, 2000; Lev, 1997). This high market value added (MVA) is usually affiliated with the growing importance of the intangible assets (Lev, 2001), which can be further divided into generative and commercially exploitable intangibles (Ahonen, 2000). The generative intangibles, which include human capital, internal and external structures, are also called intellectual capital (Bontis, 2001, 2002).
The significance of intangible assets is displayed in Figure 1. The goal of business is long-run productivity of the invested capital. The company seeks this by pursuing its business ideas using all its resources, tangible as well as intangible, under the control of leadership. Financial markets’ expectations of the company’s economic performance are reflected in the market value of the company. However, financial markets base their estimates on limited information, because they use mainly information on leadership, management and tangible assets and, even in the best case, quite scarce information on intangible assets (Lev, 2001; Hussi, 2001; Lee, 2001).

From the management point of view it is essential to recognise that none of the elements of intangible assets is *per se* sufficient for successful performance; these key elements need to be combined into a best possible balance. According to the framework presented in Figure 1 the company’s current performance is based on its existing commercially exploitable intangibles. But in order to maintain profitability also in the future, the company has to make sure that its commercially exploitable intangibles are continuously renewed. This requires investments in generative intangibles in such a way that its main dimensions develop in a balanced way. That the intersection of human capital, internal structures and external structures guarantees the creation of new commercially exploitable intangibles is most likely. The goal of elaborating generative intangibles thus is to tighten the balance and the links between these three dimensions. Of course, if the overall investments made in generative intangible assets are too large compared with the revenues, the company will end up being too costly.

Saint-Onge *et al.* have created a model called “the value platform” (see Figure 2) that explains in an illustrative way the importance of a balanced intersection between the key dimensions of generative intangible assets (i.e. intellectual capital). The contribution of this model is the intersection of the three dimensions as the area where the value is created. When relating this model to the intangible value chain presented in Figure 1, it is seen that this intersection area is the basis for the development of new commercially exploitable intangibles.

These theoretical considerations provide the framework for our study of different managing practices of intangible assets in Finnish companies. It is maintained that each company must identify its primary intellectual capital but also recognise the role of secondary intangibles. Only then will the company be able to focus on the most significant issues and the most efficient way of solving them. On the other hand, it is important to realise that this static view needs to be complemented with a dynamic one, since companies go through different development cycles, whereby the relative importance of the different dimensions of company’s intellectual capital may shift.

The research undertaken aimed to answer the following five questions:

1. (1) Which intangibles contribute most strongly to the financial performance of the company?
2. (2) What indicators does the company use to measure these intangibles?
3. (3) How does the company develop these intangibles?
4. (4) How does the company control the development of these intangibles?
5. (5) How does the company measure the effectiveness of the development of its intangible assets?

**Data and methods**

The data used in this study cover nine companies listed on The Helsinki Stock Exchange. The first phase of data collection was the selection of the case companies to be studied. The selection criteria used were high MVA and broad coverage of branches.

In the second phase of data collection analysts specialising in the selected companies were interviewed in order to identify the most important intangible assets that the analysts perceive as being the foundation for their estimates of the company’s market value. Besides the reasons for added market value the questions covered the analysts’ perceptions of generative and commercially exploitable intangibles and the possible future threats to the company.
The final phase included company interviews that were conducted in two steps. First, we interviewed a contact person in each company in order to single out the key departments and managers responsible for those most significant intangible assets emphasised by the analyst. The respondents in this first step were expected to represent strategic management and to have a broad perspective on the company’s business functions and personnel based on several years of work experience in the company. The actual research questions listed in the outline were then addressed in the second interview round, now conducted with the key personnel pointed out by the “preliminary contact persons” interviewed in the previous step. This key personnel worked typically in fields such as general management, human resources, production, marketing and R&D. The interviews with the key personnel addressed the company’s strategically most important resources, their development and the people responsible for these resources. Questions were also asked about measurement practices concerning intangibles and their development, linkages to financial monitoring and internal and external end-users of reports on intangibles. Questions were also raised about implications of measurement of intangibles on management practices both at the strategic and at the operational level. Finally future challenges were discussed.

The qualitative analysis applied to the interview data was performed using software designed for this purpose (ATLAS/Ti-workbench for qualitative analysis). The starting-point of the analysis was the question structure used in the interviews. The different observations of intangible assets found in the data were identified in order to explore the intangibles contributing most strongly to the financial performance of the company. For example, strong focusing on a loyal customer base was taken as emphasis on external structures. Aspects of development efforts and challenges of management were analysed for finding the greatest needs for development. Weak strategic focusing was seen to point up the need for developing internal structures. These findings were then related to the value platform model, which resulted in a combination of the sample companies into four main groups. The categorisation was based on the finding that companies grouped together have strengths and weaknesses in the same dimensions of intellectual capital. The results of the categorisation were listed in Table I.

A similar textual analysis was applied to the data on measurement and reporting, too. This part of the study gave important information on the intangible assets measurement and reporting practices adopted in Finnish firms. The most significant deficiencies were also analysed, as was the relationship between measurement of intangibles and the company’s rewarding practices.

### Main results

The identified company groups fell into the value platform framework as follows: external structure + internal structure, internal structure + human capital, human capital + external structure, external structure + human capital. The idea of a primary and a secondary dimension is essential, as it allows distinction to be made between, for example, the groups of human capital + external structure and external structure + human capital. Companies in these two groups operate in different branches and, for example, the current legislative regulation for companies within these groups is totally different one from the other.

In the group of “successful networking” the most valuable intangible asset is the capability of the company to manage different external networks. Intensive collaboration with foreign partners acting within the same branch has made it possible to create new ways of doing business. They have a similar aim to gather the customer relationships into efficiently manageable networks. The role of the brand is essential. A strong organisational culture helps to maintain a high quality of customer services processes.

The case example from the group is Stockmann (see Table II). It is a Finnish listed company which was established in 1862 and is engaged in the retail trade. Customer satisfaction is the central objective of Stockmann’s trading in all its areas of business. Stockmann’s four commercial divisions are the Department Store Division, the Automotive Sales Division, the Hobby Hall Division, which specialises in mail order sales and e-commerce, and Seppälä, a chain of fashion stores. Stockmann operates in Finland, Russia, Estonia, Sweden and Latvia (description is taken from the company’s Web site[1]).

The “learning systems” companies build their intangibles around the competence related to production
process efficiency. The aim of process development, on the other hand, is to take the different customer needs into account at the earliest possible phase of production. Because of tight competition these companies have to develop new innovations constantly. Thus the role of research and development functions is very significant. Openness in communications and maintaining employees’ competencies allow smooth adaptation to changes.

Here the representative company is Nokian Tyres, which is the largest tyre manufacturer in the Nordic countries and the only manufacturer in the world with strategic focus on products designed for northern conditions (see Table III). They develop and manufacture summer and winter tyres for cars and bicycles, tyres for heavy-duty vehicles as well as retreading materials. The tyre chain, Vianor, is the largest in the Nordic countries. It consists of 157 outlets in Finland, Sweden, Norway, Estonia and Latvia. Nokian Tyres has established a subsidiary, RoadSnoop Ltd, for commercialising and internationalising the intelligent tyre technology concept it has created (description is taken from the company’s Web site[2]).

“Competence without boundaries” companies are essentially based on the innovation potential of highly competent personnel. In the commercialisation process of innovations the significance of patents is high. The legislative regulation of Finnish companies falling into this group is relatively small when compared with foreign competitors. This difference has given these companies relevant competitive advantage. Characteristic of the organisational culture is that research and development functions are very autonomous, implying that R&D personnel have had the greatest possible freedom to create new innovations. As the strategic biases are changing towards international markets, the companies try to expand their competence to new markets both geographically and in the sense of new branches.

The reference for this group is Sonera, the leading mobile communications operator in Finland (see Table IV). Sonera pushes ahead energetically with its development of services. For example, the first services making use of positioning technology are already available. Sonera has associated companies that provide GSM services in five countries: Turkey, Estonia, Latvia, Lithuania and Russia. In addition, Sonera has a 14 percent stake in a Lebanese mobile operator Libancell. Through its associated companies Sonera is also present in 3G markets in Germany (Group 3G), Spain (xFera) and Italy (Ipse, 2000) (description is taken from the company’s Web site[3]).

“The network of the excellences” companies are rather tightly regulated. It is a necessity for a company to have competent personnel in order to be able to meet the challenges of tight regulation. The companies have built networks with, for example, universities and different research institutes. Because of tight regulation, the innovation per se is not sufficient. The commercialisation of a new product may take even several years and is thus very expensive. Protection of those products in the market by immaterial property rights is highly important for these companies.

Orion (see Table V) is the leading Finnish group of businesses specialising in products for health care. The core of Orion’s business operations is Orion Pharma, its largest business division, which develops, manufactures and markets pharmaceuticals. Oriola is a pharmaceutical wholesaler and distributor and a marketer of a comprehensive range of health-care equipment, instruments and supplies. Orion Diagnostica specialises in diagnostic point-of-care tests and test systems. Noiro manufactures cosmetics as well as products for personal care and institutional hygiene. The business divisions operate independently, developing their operations on the basis of their own strategies and aiming at sound profitability (description is taken from the company’s Web site[4]).

Our study can be seen as a device for classifying companies according to the significance of intellectual capital. It shows that, although intangible assets are per definition highly company-specific, there are important linking points in the field of development strategies, where illustrative generalisations can be made.

In the collected company data the concepts like “intellectual capital” or “intangible assets” were not all that common. Instead the focus was more on separate elements of intangibles such as brands, human resources etc. The fundamental idea behind measuring intangibles is a wish to explore the results and effectiveness of the different development projects undertaken. These projects can be aimed, for example, at organisational or functional development.
All dimensions of intangible assets were well covered by our data. There is a strong tradition in Finnish companies of measuring and developing human capital. Internal and external structures are also monitored to some extent. Changes in business processes are in effect recognised as the most important option for introducing new monitoring procedures. Finnish companies have a long tradition of measuring, for example, customer satisfaction, which makes them familiar with measuring external structures. The respondents also express an interest in the measurement of customer loyalty. Although external structures are seen as being crucial in, for example, retail business, they have so far not been sufficiently analysed and put into an IC context.

An interesting parallel with the measurement of intangibles is environmental reporting, which some companies included in the data perform regularly. These companies set similar goals for environmental issues to those for all other activities and the monitoring is the same, too. Many companies have an externally distributed environmental report.

The measurement of intangibles is highly company-specific. The development of indicators can be a very creative process, where even the wildest ideas may lead to applicable indicators. Often ideas arise in informal discussion and good ones are then included in the official discussion. The respondents were quite sceptical about the possibility of finding a measurement concept that would suit all companies. They rather expected that some base lines can be created, but that these always have to be tailored to meet the specific needs of a company.

The analyst interviews indicate that investment markets use information on commercially exploitable intangibles to some extent, while that on generative intangibles plays quite a limited role. Partially this is due to the fact that some companies consider it harmful to publish information on their generative intangibles. In many cases the investors base their expectations solely on the branch in which the company is engaged. This is the case particularly for companies in branches with high growth expectations. The limited availability of information is definitely a problem for investor markets.

By versatile reporting on its assets a company can build up a comprehensive picture of its activities. Since producing this kind of information is currently totally voluntary, companies publish only selected sections to their stakeholders. All companies in our data were, nevertheless, interested in the measurement of intangibles. Currently the follow-up of intangibles in our case companies is still descriptive, but the aim is to develop the measuring into a systematic activity that would produce comparable numeric or other kind of information.

Discussion

Our paper strongly supports Edvinsson and Malone’s (1997) view that intangibles essentially form integrated entities. Similar conclusions have been made by Brynjolfsson and Yang (1999), who have demonstrated that IT investments get heavily leveraged by other types of intangibles. We furthermore want to stress that every successful company not only possesses all kinds of intangibles but always has a relative emphasis on one type of intangibles, which gets support from other intangible and tangible assets. Our data do not provide conclusive evidence about certain lifecycles of intangibles, but the expert interviews indicate that each company not only puts emphasis on one type of intangibles at a time but also shifts that emphasis to other intangibles over time. We find these conclusions important, because they urge managers to ask which intangibles are those on which to concentrate and which need to be prepared for the next stage of the product or business life-cycle.

Notes


**Figure 1.** Framework of the study

![Framework of the study](image)

**Source:** Hussi (2001)

**Figure 2.** Value platform model

![Value platform model](image)
Source: Edvinsson and Malone (1997)

Table I. Categorisation of organisations

<table>
<thead>
<tr>
<th>Secondary intellectual capital</th>
<th>Human capital</th>
<th>Internal structures</th>
<th>External structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human capital</td>
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<td>Network of excellences</td>
<td></td>
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<tr>
<td>Internal structures</td>
<td>–</td>
<td>Successful networking</td>
<td></td>
</tr>
<tr>
<td>External structures</td>
<td>Competence without boundaries</td>
<td>–</td>
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</table>

Source: Hussi (2001)

Table II. Financial facts of Stockmann (retail trade)
Table III. Financial facts of Nokian Tyres (tyre manufacturer)

<table>
<thead>
<tr>
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<th></th>
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<tbody>
<tr>
<td>Turnover</td>
<td>766</td>
<td>876</td>
<td>1,036</td>
<td>1,160</td>
<td>1,216</td>
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<tr>
<td>Profit</td>
<td>36</td>
<td>42</td>
<td>49</td>
<td>66</td>
<td>57</td>
</tr>
<tr>
<td>Total assets</td>
<td>487</td>
<td>534</td>
<td>613</td>
<td>654</td>
<td>731</td>
</tr>
<tr>
<td>ROI %</td>
<td>12.7</td>
<td>13.2</td>
<td>13.3</td>
<td>15.6</td>
<td>12.3</td>
</tr>
<tr>
<td>Number of personnel</td>
<td>5,248</td>
<td>6,015</td>
<td>6,589</td>
<td>6,934</td>
<td>7,361</td>
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<tr>
<td>Investments in fixed assets</td>
<td>23</td>
<td>46</td>
<td>56</td>
<td>53</td>
<td>86</td>
</tr>
<tr>
<td>M to B ratio</td>
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<td></td>
<td></td>
<td></td>
<td>2.0</td>
</tr>
</tbody>
</table>

Table IV. Financial facts of Sonera (information and communication technologies)

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</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>164</td>
<td>187</td>
<td>193</td>
<td>212</td>
<td>251</td>
</tr>
<tr>
<td>Profit</td>
<td>17</td>
<td>20</td>
<td>24</td>
<td>28</td>
<td>33</td>
</tr>
<tr>
<td>Total assets</td>
<td>145</td>
<td>154</td>
<td>171</td>
<td>188</td>
<td>269</td>
</tr>
<tr>
<td>ROI %</td>
<td>18.1</td>
<td>20.2</td>
<td>20.8</td>
<td>21.5</td>
<td>19.8</td>
</tr>
<tr>
<td>Number of personnel</td>
<td>1,240</td>
<td>1,350</td>
<td>1,329</td>
<td>1,358</td>
<td>1,620</td>
</tr>
<tr>
<td>R&amp;D costs</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>M to B ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.9</td>
</tr>
</tbody>
</table>

Table V. Financial facts of Orion (health care)

<table>
<thead>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>891</td>
<td>991</td>
<td>1,124</td>
<td>1,351</td>
<td>1,622</td>
</tr>
<tr>
<td>Profit</td>
<td>162</td>
<td>154</td>
<td>170</td>
<td>285</td>
<td>289</td>
</tr>
<tr>
<td>Total assets</td>
<td>1,213</td>
<td>1,380</td>
<td>1,450</td>
<td>1,865</td>
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</tr>
<tr>
<td>ROI %</td>
<td>18.1</td>
<td>20.2</td>
<td>20.8</td>
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</tr>
<tr>
<td>Number of personnel</td>
<td>6,930</td>
<td>7,239</td>
<td>7,667</td>
<td>7,967</td>
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<tr>
<td>R&amp;D costs</td>
<td>35</td>
<td>39</td>
<td>32</td>
<td>45</td>
<td>52</td>
</tr>
<tr>
<td>M to B ratio</td>
<td></td>
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<td>7.6</td>
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<tr>
<td>Turnover</td>
<td>663</td>
<td>697</td>
<td>736</td>
<td>789</td>
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</tr>
<tr>
<td>Profit</td>
<td>98</td>
<td>100</td>
<td>106</td>
<td>121</td>
<td>109</td>
</tr>
<tr>
<td>Total assets</td>
<td>851</td>
<td>872</td>
<td>912</td>
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<td>955</td>
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<tr>
<td>ROI %</td>
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<td>14.1</td>
<td>13.7</td>
<td>14.4</td>
<td>11.6</td>
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<tr>
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<td>5,147</td>
<td>5,244</td>
<td>5,322</td>
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</tr>
<tr>
<td>R&amp;D costs</td>
<td>52</td>
<td>53</td>
<td>56</td>
<td>56</td>
<td>63</td>
</tr>
<tr>
<td>M to B ratio</td>
<td></td>
<td></td>
<td></td>
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<td>2.0</td>
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</table>

References


Lev, B (1997), "The boundaries of financial reporting and how to extend them", International
Conference on Industrial Competitiveness in Knowledge-Based Economy, Stockholm.

Essay III

DECOMPOSING INTELLECTUAL CAPITAL WITH MAINTENANCE OF WORK ABILITY FRAMEWORK

Tomi Hussi

The author would like to thank Rita Asplund and Guy Ahonen for their valuable comments. The financial support of The Finnish Work Environment Fund is gratefully acknowledged.
Abstract

This study shows that definitions of intellectual capital (IC) provided by the IC experts interviewed have very much in common with the maintenance of work ability (MWA) concept that is the central framework for Finnish occupational health and safety activities. Both concepts include competence, internal structures and relations. Only the emphases differ. IC has a more collective notion of competence than MWA. IC also places more emphasis on the productive aspects, whereas MWA stresses security and wellbeing. The biggest difference is in the way individual health is treated. MWA assumes that health is a very important element of productive capacity, whereas some of the IC experts interviewed ignore it. It is obvious that IC experts have much to learn from MWA experts about how psycho-social health affects people’s innovativeness and productive behaviour. In particular, the study shows how elements of occupational wellbeing outline the dynamics of the IC framework.

Key words

intellectual capital, knowledge creation, maintenance of work ability, employees’ wellbeing, sustainable economic development
1 Introduction

The new technologies, globalisation and ever-increasing emphasis on intangibles have created a whole new basis for transactions in new markets. Thus, companies are facing new opportunities, as well as new risks. Characteristic of this development has been that the Internet has given access to these new opportunities. (Sullivan, 2000.) Increasing competition is forcing more and more companies to operate in global markets. Relaxation of the regulations, as well as technological development, is an important reason behind this development. Another significant change can be seen in products that become increasingly knowledge-intensive. In the information age economy, the primary sources of wealth are knowledge and communication, whereas the importance of natural resources and physical labour is decreasing.

These two contemporary mega trends have been the main drivers behind the emergence of intellectual capital (IC) to explain the change in business logic. As several authors have shown (see, for example, Hussi, 2004; Sveiby, 1997; Nonaka and Takeuchi, 1995), knowledge has a central position in this setting. Knowledge is unavoidably dependent on the human capital of an organisation. Accordingly, employees’ health, and more broadly wellbeing, can be seen as a central prerequisite for successful knowledge management. However, these issues have only superficially been addressed in IC literature. Brooking (1996) mentions employees’ health as one indicator of intellectual capital but no further elaboration is provided. More recently, Edvinsson (2002) has also glanced at these issues as part of the corporate longitude.

In this paper, I will address the intellectual capital concept from the point of view of maintenance of work ability. The paper will discuss the importance of the health and wellbeing aspects in relation to the IC and, thus, work on the topic that has so far been discussed in only a limited fashion. Section two explains the maintenance of the work ability framework. In section three, the design of this study and four the results of the analyses are presented. Finally, section five concludes the paper by showing the importance of wellbeing in relation to intellectual capital.

2 The maintenance of work ability approach

The long-term goal of a company is to maintain a balance between investments and productivity. It is quite obvious that wellbeing cannot be improved limitless without negative effects on the economic performance. Accordingly, it is not possible to improve financial performance excessively by exploiting employees’ wellbeing. This is the main principle in sustainable economic development. (Ahonen, 1998b.) Emphasising economic performance by neglecting the development of personnel and work conditions only improves a company’s short-term cost-efficiency. However, employees’ wellbeing is one of the key elements in long-term productivity and quality development. (Bjurström et al., 1993.) Sustainable economic development means that the financial result is seen in relation to those inputs that have been made to achieve it. This relationship is described in Figure 1, where productivity and efficiency represent
economic information, which is presented in financial reports and the ability to work and quality indicate the state of personnel resources. Excessive sacrifices and the denouncement of employees lead to untenable turnover and profit increase as the wellbeing of the personnel resource is threatened. By developing its resources, the company secures future profitability, whereas it is threatened by burdening resources. Skilful management can balance current and future requirements. Correct information about changes in the personnel resource’s state and financial results is essential for this balancing. (Ahonen, 1998a.)

Figure 1 Sustainable economic development

Maintenance of work ability is a central framework for occupational health and safety activities in Finland. Health is not the only factor influencing the work ability but competence, work community and work environment are also included in the framework (see Figure 2). Because of its comprehensive nature, this framework is also central in ensuring sustainable economic development. The maintenance of work ability includes activities that aim at improving the physical and mental condition, adopting healthier ways of life, developing professional skills and adaptation to changes, and supporting job satisfaction and motivation by feedback and reward systems. (Aro, 1998.) Collaboration between members of the work community, as well as different work organisations, is strongly emphasised. An individual is an active doer and participant instead of a mere object in this framework. Everyone has to take

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1 This figure is adapted from Liukkonen’s (1998) model on Dual-evaluation.
responsibility for his or her own work ability. This means adopting new work roles and the courage to build new ways of collaboration. Successful maintenance of work ability requires a clearly defined programme with outspoken goals and temporal limits. The goals must be in proportion to the organisation’s other activities. (Rissa, 1996.) Introducing such a programme requires a decision by the management and definitive commitment. Otherwise, the activities are inadequate and chances of success are poor. (Louhevaara, 1999.)

![Diagram of factors influencing an individual’s work ability](image)

Source: Huuskonen et al. 1997

**Figure 2 Factors influencing an individual’s work ability**

The competence dimension has been included in the MWA framework because it appears that radical changes in content and methods of work imply heavy development challenges to professional qualifications practise. (Rantanen, 1998.) Deficiencies in professional skills can rapidly turn into a serious problem in work life. This is also a health-related threat as it creates a strain and increases work related stress. (Ilmarinen, 1999b.) The competence dimension in the maintenance of work ability is targeted at securing the employee’s ability to perform work tasks by professional competencies. (Anttonen et al., 1998.)

Traditional technical planning competence and non-verbal skills are losing their importance. The skills related to verbal and symbolic interaction are increasingly important as different networks and contacts need to be used quicker when needed. Good connectivity through social skills helps an individual meet the uncertainty of the future. (Huhtanen, 1999.) Empirical results show that the improvement of professional competencies is an important orientation because it helps create a healthy organisation with natural collaboration. (Juvansuu et al., 2000b.)

According to the MWA literature, the starting point for the development of work was the aim of improving occupational safety by identifying and removing individually oriented biomedical health hazards (Huuskonen – Kalimo, 1999; Rantanen, 1998; Rantanen, 1995). Later on, the scope has broadened from industrial hygiene and toxicology to more general prevention of occupational injuries and accidents. Currently, some 30 – 50 % of the Finnish labour force is still exposed to physical-chemical or mechanical threats and even one third of labour force encounters physical strain in tasks (Rantanen, 1998). Accidents and work related illnesses have dramatic economic
implications at a company level. Furthermore, they affect the wellbeing of the employees’ and, thus, the innovation environment of the whole company. (Salmenperä et al., 2000.) It has been estimated that occupational accident related absences alone are 0.5 billion euros per year in Finland (Aro, 1998).

The constant need for innovativeness places new demands on working life. It is common to all innovation supporting procedures that they enhance dialogue. In the core of this dialogue are question-and-answer-oriented interaction and the culture of challenging ideas. This new tolerance for contradictions and systemic challenging of the ideas places heavy demands on the functioning of the work community. (Salmenperä et al., 2000.) The increased diverseness of working life reduces the number of permanent jobs and they become part-time and changing in content. This development causes a paradox as shortened employment leads to uncertainty in employees and this means less innovativeness. (Huuhtanen, 1999.)

The atmosphere, social support and control over work tasks experienced by the employee are increasingly important as prerequisites of work ability. Development of work communities becomes increasingly important for companies. (Huuskonen – Kalimo, 1999; Jurvansuu et al., 2000b.) For example, changes in the organisation of work may alter mental and social requirements in a way that differs strongly from the traditional tight management style (Rantanen, 1995). A fast pace, monotonous tasks and unnecessary rules concerning work are all negative to wellbeing. (Jurvansuu et al., 2000b). Optimising the pace of changes and controlling the excessively fast work pace are some of the most essential challenges in the development of work tasks and the work community. (Huuhtanen, 1999.)

Increasing knowledge-intensiveness of working life modifies the work environment and ergonomics related questions significantly. Over 60 % of Finns use information and communication technologies in their work. (Rantanen, 1998.) Every-day work is distracted by constant changes in the technological work environment and malfunctioning of the computer systems. If such deviant situations last long, they can lead to excessive pressures and stress reactions. (Huuhtanen, 1999.) To meet these new requirements, research scope has to be broadened from individually oriented biomedical research to analyse the causes behind disability in a specific work context and its requirements. (Rantanen, 1995.)

Traditionally, MWA has been characterised by placing the emphasis on physical exercise and individuality. (Jurvansuu et. al., 2000b.) Maintenance of work ability has been seen as most topical for elderly workers because combining changing capabilities with work demands is increasingly difficult for ageing workers. The physical work load does not change even though the respiratory, circulatory and musculo-skeletal capacities decrease depending on physical activity. In tasks requiring much mental work, psychological requirements and qualitative difficulty increase while accuracy and speed of perception decrease. (Ilmarinen, 1995.)

Physical exercise is an important factor in improving work ability because, as well as the physical effects, it also increases mental resources. (Ilmarinen, 1995.) It has been shown that well-designed MWA is able to reduce sickness absences and early
retirement. At the same time, productiveness improves. The financial benefit gained by such a development can be substantial. (Ministry of Labour, 1996.)

However, it is important to see that physical health per se does not define work ability, but it is a sum of the physical, mental and social capacities. (Rantanen, 1999.) The employees’ wellbeing is one of the key elements in long-term productivity and quality improvements. Special attention must be given to mental as well as physical wellbeing. (Bjurström et al., 1993.) It has been estimated that over half the Finnish labour force report that the excessive work pace causes stress and hinders work performance. Improving the quality of the psychic work environment making it possible to cope with a hectic work pace and stress combined with psycho-physiologically suitable working hours will be an essential task for the future maintenance of work ability activities. (Rantanen, 1998.) Long-lasting and uncontrolled work-related stress can lead to burnout, characterised by chronic fatigue from which one does not recover by normal rest, increased cynicism and weakened professional self-respect. Maintenance of work ability and other development activities are essential in preventing it. The work demands and an individual’s resources must balance. (Huuskonen – Kalimo, 1999.)

A maintenance of work ability programme can be seen as part of a company’s quality system. This way the MWA programme supports the organisation’s attainment of its strategic goals and assists in understanding the development of personnel resources as a whole, because actual and reliable information is obtained about the personnel’s ways of action, competencies, wellbeing and job satisfaction. An organisation can get a comprehensive understanding of its resources when linking personnel indicators to other monitoring systems. (Aro, 1998.)

The starting point for the Finnish maintenance of work ability approach can be traced to a memorandum on maintenance of work ability in workplaces created by social partners in 1989. This resolution was written into the law on occupational health in 1991. The new compensation system for occupational health services in 1995 included maintenance of work ability in coverable activities. (Bergström et al., 1997.) According to Finnish authorities, maintenance of work ability programmes include all such work-related actions that the employer, employees and collaborating organisations perform in co-operation, in order to improve and support the work ability and functional capability of every individual taking part in working life in every phase of their work careers. (Ministry of Labour, 1996; Ministry of Social Affairs and Health, 1992.)

Ilmarinen (1995; 1999a) defines work ability as a relationship between an individual’s resources and the demands of the task. According to this definition, an individual’s resources consist of health and capacity, training and competencies, relevant values and attitudes, motivation and job satisfaction. These resources are used in the work, in which the work community, work environment and work related mental and physical demands also have an influence. This context has an essential effect on an individual’s capability to use his resources. According to this definition, work ability is a dynamic process that changes via its components as an employee ages. An individual’s work ability is further related to the personal networks (such as family and friends), organisation and surrounding society.
Launis et al. (1998) analysed employees’ conceptions of their work ability, strengths, influencing factors and MWA plans in four organisations. The results show that work ability was mainly understood as employee’s health and individual characteristics. Plans for maintaining work ability were heavily biased by influencing these characteristics, for example, by physical fitness activities or individual rehabilitation. At the same time, the problems of work ability arose mostly from continuous expansion and ambiguity of work tasks, unclear division of labour, inadequate methods, lack of shared planning and undermining the personnel. The disparity between the problems observed and activities undertaken was considerable. The plans did not generally meet the observed challenges of the changes in work. This is seen to be due to the historical background of the work ability concept that relates it to the social security system. In this setting, it is essentially linked to evaluating an individual’s disability and, therefore, the emphasis on medical and expert-oriented approach has been distinctive and other dimensions, that are seen to be more relevant in current work life, are neglected.

These censorious findings on MWA activities undertaken in companies argue that the maintenance of work ability approach requires new linkages to organisational performance in order to maximise the potential of this approach. Thus, the linkage elaborated in this paper is not only relevant from an intellectual capital point of view in opening a broader wellbeing perspective, but also to the MWA discourse as the new formulation of economic influences helps design activities that contribute more to the organisation’s daily functioning. The next section scrutinises the research design of this study.

3 Research design

This paper discusses how intellectual capital (IC) is structured when the maintenance of work ability (MWA) is the framework of analysis? This research question further divides into two sub-questions: What is common to both frameworks? and What areas of MWA go beyond the current concept of IC but are relevant for knowledge?

These questions are approached by an analysis of interview data comprising ten experts in the field of intellectual capital. The selection criteria for these experts were the high-level of expertise and as broad a coverage of different perspectives as possible. The distribution of interviewees according to their occupational backgrounds is presented in Table I. Interviews were conducted in April - May 2000. In the results section, I have labelled the interview references of consultants and the enterprise representative as business life actors. Research institute and university representatives are labelled academics.

<table>
<thead>
<tr>
<th>Background</th>
<th></th>
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<tbody>
<tr>
<td>Research institutes and universities</td>
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<tr>
<td>- 2 professors in accounting</td>
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<tr>
<td>- 2 professors in business studies</td>
<td></td>
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<tr>
<td>- 1 director of IC research institute</td>
<td></td>
</tr>
<tr>
<td>Chief knowledge officer</td>
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Table I Backgrounds of the intellectual capital experts interviewed

<table>
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<th>Consultant</th>
<th>4</th>
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<tr>
<td>group includes authors of the publications that are most read in the field of IC. All of these interviewees have a recognised status in the field. They have also made academic contributions.</td>
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</tbody>
</table>

Total 10

The interviews were performed following a predefined question structure, which can be found at the end of this essay. The leading idea in generating the interview structure was to form questions so that they would be in line with general IC theory in the beginning and gradually adopt more unorthodox perspectives. The simultaneous collection of analogous interview data among MWA experts also influenced the selection of the questions.

The four dimensions of the Maintenance of Work Ability framework described above were used as the analytical lenses for outlining the data. For more detailed discussion about the analysis method and related methodology, please see the overarching article of this thesis. The results of these analysis processes are presented in the following section.

4 Results

This section scrutinises the interview data of IC experts from an MWA perspective. It is divided into four subsections following the maintenance of work ability model; namely competence, work environment, work community and health. The empirical findings of the following sections are reconstructions of the expert interviews in a given context. The reconstructions are verified by actual citations from the data, where applicable.

4.1 In intellectual capital, the angle of competencies turns from an individual to a collective character

According to the data of this study, the radical change that has taken place in relation to competence on a general level is that previously the concept of capital was related to financial investments in machines and equipments. Human capital makes investments in competence as relevant as financial investments. Thus, an enterprise is not seen as an economic entity consisting solely of investments in means of production, but as a sum of many very different contributions. Furthermore, competence and knowledge are non-rival assets. This means that they do not wear out but on the contrary get stronger. They are not diminished when shared between people but this also makes them stronger. It might even be the case that the competence related investments are the most finite and valuable form of investments. Understanding this changed logic can help create a new picture of what is an enterprise and, therefore, understand the management and attaining of competence investments.

...human capital is then the individual’s knowledge, the competence and the knowledge belonging to the individual human being employed by the firm.
So (in terms of intellectual capital [T. H.]) we are by no means talking about a new outline of the old knowledge… at its best we are able to reveal a new kind of concept of what is an enterprise. And we are able to understand management and attainment of those investments that are most finite and valuable in modern society, that is, competence investments.

The competence-based strategy is seen in the data as a very difficult concept to operationalise. Intellectual capital is taken as a conceptual tool that facilitates this challenge. When organisations were analysing their core competencies, these were seen in a static way. The aim was to become aware of what kind of knowledge stock the organisation possesses in order to create a competitive advantage. Individual’s competencies and knowledge have a central role also in the IC framework, but this approach emphasises dynamics. Primarily intellectual capital is about how the knowledge of employees is applied in the organisation. This relationship is especially evident in knowledge-intensive organisations, but it is difficult to imagine any organisation that could run without human capital because even the highly automated process industry has skilled experts to maintain and develop the processes.

… we get a chance to specify what we mean by competence – what we mean by a bundle of skills and expertise and technologies and how they relate to each other. So when I talk about the intellectual capital I talk about the bundle of skills, expertise and technologies that make competencies work.

The experts interviewed argue that the competence that an organisation currently possesses is directly connected to its financial performance because it is at the core of business activities. But in the longer run, the organisation also needs renewal capacity. According to the interview data, the renewal capability is based on the ability to create new knowledge. Therefore, it can be said that the idea of trying to develop a framework for IC is an attempt to transform tacit knowledge into explicit knowledge. For example, training and competence mapping activities have focused primarily on explicit knowledge on the individual level, whereas most of organisational elements of competence are actually tacit. The development of collective organisational competence is a long-term activity that builds grounds for knowledge creation in a more fundamental way and can be seen as a strategic approach towards development activities.

A project group should always consist of members with different levels and areas of expertise. A couple of juniors have to be taken along because one problem organisations have is that the best experts are wanted for different projects but the interest in taking junior employees in is much weaker. This leads to a situation where the most competent people increasingly accumulate knowledge, but tacit knowledge is not transferred to juniors through socialisation.

It is emphasised in the data that the knowledge creation approach has switched the competence focus from individual to collective capability, which results in organisational capacity. Professional competence is seen by the experts interviewed to
form the base of human capital but it is the organisational links connecting creative employees that creates the dynamics of innovativeness in an organisation. The cumulated stock of knowledge and skills represent the potential of an individual but this needs to be actualised. Firstly, social incompetence leads to a situation where an individual’s knowledge cannot be applied wider in the work community and the value-added of an employee is relatively low. Secondly, the link-building approach to competence emphasises social skills to create social spaces where new ideas and creative relationships can be built on trust between different parties. And thirdly, a business-related understanding is important, because the mere ability to create new products is useless unless these ideas are connected to the general business logic of an organisation. Professional, social and business competence are complementary elements and none of these as such is generating added value.

If your social competencies are non-existent, the organisation cannot use you and you cannot connect your expertise to the competencies of the others and no added value is created. Many different abilities are required - you have to have expertise on the substance, social skills and if you don’t understand anything about the business you might be able to come up with new products, but they do not have value in the business sense. All these elements have to exist sufficiently in all individuals but also in the structures of the organisation and the right people must be found so we can use the right people in the right places. No single element as such is able to create added value.

Business life actor

However, the interviewees also emphasise that companies cannot solely rely on renewal but commercial exploitation of current knowledge is also needed. It is the balance between efficient production and continuous investments in further training, research and development in the long run, that is essential. Neglecting all development activities like training and focusing only on serving the customers creates a positive effect on financial performance in the short run. But at the same time, it weakens an organisation’s ability to adapt to future changes in the markets and endangers long-term success. An organisation should be able to control both short and long-term cycles of competence at the same time. It should be able to make long-term investments on creation of the knowledge base, but yet be able to flexibly take advantage of its current knowledge base. However, quite often the short-term perspective is emphasised at the expense of longer term. It is often not a problem to get good financial performance in the short run by excessive workload and excluding investments in internal development and market relations.

Let’s think, for example, about a company that is producing mobile phones. It has been very strong in first generation technology and still focuses on developing that further. The markets are in those countries that are still using this technology. All inputs are targeted to more efficient selling of these phones. Suddenly the market situation changes and the second-generation technology seizes the market and the previous technology is no longer used. The company has lost its business because it has been unable to follow the changes that take place in the markets and the knowledge base has become obsolete. There are many examples of such development.
4.2 Information and communication technology and supporting creativeness as features of the work environment shaping intellectual capital

It is argued in the data that besides competencies, innovativeness also requires information. In the implementation of a knowledge management system, everyone has to have access to information. Internal structures comprise such things as software programs, customer databases and different monitoring tools. Early applications of knowledge management emphasised the importance of information systems and there were attempts to build processes upon these already existing applications. Actually, the direction should be quite the opposite, and the role of information and communication technology to enable and support knowledge sharing. Taking information and communication technology systems as a starting point cannot be expected to be fruitful but it is the responsible employee or team that can determine the criteria for seeing one piece of information as valuable and another not. Information flows in current organisations are so huge that skills for filtering out the information, that is most relevant for oneself, are highly important.

If I talk about knowledge management to an American, for example, he will immediately say: “Ok, it’s the intranet you are talking about.” And my response is that it’s not at all about the information and communication technology based tools. They are enablers, that make this possible in today’s world, but they cannot be taken as a starting point. […] taking information and communication technology systems as a starting point they built this Future Watch system but it turned out to be totally useless.

Business life actor

Besides organisation’s internal use, the experts interviewed emphasise that modern information and communication technology can also be used in external relations. For example, customer feedback has traditionally been recorded, but this information has been used quite limitedly. Developing feedback processes that enable learning make it possible to truly learn from customers. Furthermore, efficiency of communication has made it possible to work in different ways than before, like efficient collaboration with people from different parts of the world.

For example, I’m working as a guest editor for this journal. And this journal is managed from Australia. We have three editors and one of them is located in Hong Kong, the other one is in Sydney and I’m here. And we have never met upon that issue and actually I have never met one of the editors, I have never seen him as far as I know. But still we work together and we have developed an efficient way of communication. (…) So this is, I mean the new technology facilitates contacts in a different way…

Academic

It was noted in the data that companies might be interested in getting savings by postponing investments in the work environment. For example, moving information and communication technology investments into the future can result in considerable short-term savings. At the same time, reluctance to make such investments is growing. It is necessary that these investments are considered with respect to the general view of the organisation.

… process issues like leased IT tools that we really should develop but current ones are still applicable. A three-year leasing-contract forces us to renew them after that period and this keeps
us using up-to-date tools. If we have bought them, there is easily the temptation to postpone investment. (...) Costs crumble, which looks wonderful, and this does not even have observable influence on fluency of the work processes, either. But it [balanced scorecard (T H.)] might show that we are forced to continue one more year with the old systems contrary to our plans. Then somebody could argue that this will rebound on us because new systems are even more expensive and you have conditioned yourself and the organisation to thinking that information systems are actually inconsequential. It is precisely such things that have to be constantly thought about.

Business life actor

Another perspective in the data on the work environment discusses the work environment from a creativeness point of view. According to this view, work environments should be designed so they are ideal for knowledge creation. This shifts the focus radically from traditional analysis of health hazards to structures supporting knowledge creation.

What are the best environments for people to create new knowledge? That to me is a very interesting question. You tend to be so focused on, you know, avoiding bad environments for health. How about building really good environments for creativeness, that's a true challenge for IC research.

Business life actor

4.3 Leadership practises that support collaboration shape the development of the work community

According to the data of this study, globalisation and the emerging information society create enormous turbulence in the business world. Organisations may not be able to define what kinds of competencies are needed even in the near future. To meet these radical demands caused by the modern pace of changes, the strategic planning of organisations is forced to be more sensitive to all the changes that take place in their surroundings. Learning occurring inside the organisation is not enough, because it only accumulates knowledge that already exists in the organisation. The ability to adapt to changes in the surroundings also requires learning from external structures, such as customers, collaborators and even competitors. Within an organisation, strategic abilities are improved by having an increasing number of people participate in the conception of the organisation’s purpose and goals. This makes it possible to sharpen the clear-sightedness of the strategy by picking up weak signals, but, at the same time, employees are better able to apply the guidance of strategy to daily functioning. Having people making observations and judgements together makes it possible to distribute decision-making to a wider group. In an open communication culture, weak signals can give rise to strategic planning from different directions, which strengthens them. The ability to observe weak signals makes it possible for companies to anticipate future changes better than their competitors.

I think that the previous market setting of Nokia and Ericsson is a classical example. Ericsson was a much more developed, stronger and robust organisation and thus they could not see Nokia as a dangerous competitor. Nokia renewed everything, as they made huge investments in new kinds of competitive factors, such as aesthetics, speed and flexibility. Ericsson was not at all able to see this as a threat. Nokia was far ahead, when Ericsson realised that the rules of the game had changed. Suddenly it was not important to consumers that Ericsson’s and even Siemens’s
phones had better results in technical tests. The consumers wanted nice looking phones and quickly changed models - the brand and the whole ‘drive’ was suddenly the most important competitive factor.

Business life actor

The interviewees argue that intellectual capital is dynamic and so is not just the feature of an individual but is essentially a communal characteristic, where individual actors are combined with something more than if they were alone. Because organisational learning is a communal process, an organisation needs to create structures that set the framework for development, that is, define its intellectual capital. Outspoken vision and strategy statements help build a hermeneutic preconception of the context in which employees participate. They set the frame of reference, for example, for recruiting and development of the employees, as they are manifestations of organisational values. Individually based competencies result in only a short-term competitive advantage because they are lost as the employment ends. Focus on collective organisational competence generates more lasting change in the organisation as knowledge is also transferred to others.

… individuals and their competencies within the organisation are not enough but it is essentially about the organisational capability to build linkages between these competent individuals.

Academic

According to the experts interviewed, the collaboration and communication culture that prevails in an organisation is as distinctive to knowledge management as the availability of information provided by the information systems that were discussed above in relation to the work environment. Inefficient communication may cause frustration, as observations of upcoming failure do not diffuse over the organisation. A group or team systematically needs opportunities to reflect on the learning and work processes being used. Learning diaries and other tools can be very useful in the reflection process. An open and systematic suggestion scheme has been shown to be a good starting point and a backbone for development. A recognised tool for making initiatives is highly motivating for all members of the work community as they feel they can influence the development of the organisation.

When we start implementing some sort of knowledge management system, everyone’s competencies have to be appreciated. Everyone has to make sure that he has access to current information, everyone’s creativity is valued, there is an attempt to capture and process all ideas that spring up in the organisation in order to come up with new innovations. (…) This suggestion theme requires that [T. H.] a supervisor has to respond to an idea within a given time. Otherwise the personnel department gives the answer and the supervisor gets a complaint about this. The providers of successful suggestions are rewarded by 20 percent of the annual savings. This kind of mechanism is highly motivating to the employees because they feel they can really influence the functioning of the organisation. (…) Feeling of control over the organisation’s functioning creates commitment and positive attitudes among the employees. Happiness and appreciation of work are at a good level because everybody knows the goals and their individual contribution in attaining them.

Business life actor

The data shows that traditional top-down management is not able to observe the multitude of insights that are gained by the front-line personnel. The scientific
management paradigm saw employees as nothing but a continuation of the machines. Leadership has to shift from supervision towards stimulating relationships. Besides building different combinations of relationships, a leader can also play an active role by destroying obsolete organisational structures that hinder the efficiency of employee’s information supply. The definition of the knowledge worker states that an employee must know more about his field of expertise than the manager. Therefore, it is the knowledge worker alone who can decide what kind of information is needed. Employees need the freedom to try out innovative solutions. This shift of power structures places great responsibility on the employee, but at the same time, work becomes highly motivating.

... extensive attitude surveys and they build up extensive databases comprising attitudes towards a number of things, including leadership. And they also had productivity and efficiency data and then they tried to correlate and find which are the correlations, what is driving the value. And what you can see is often that leadership is maybe the biggest intangible resource that drives the value or drives, if you want, intellectual capital.

Academic

New business logic is argued in the data to come from the tension between organisational efficiency and the ability to create knowledge that results in innovations. Besides strategic abilities, companies also need dynamics for change. Seeing the future needs clearly is far from enough, if a company is unable to focus its efforts on the strategic goal. The ability to create ideas alone is insufficient, but an organisation also has to be able to exploit the commercial potential in them. Some companies are very good, for example, at research and development and creating new patents, but the next question is how to exploit this patent, make it commercial. The renewal capability focuses on the organisation’s ability to create strategic choices and generate added value in order to gain financial benefit. Without this the organisation becomes passive and repeats its old practises without being able to create anything new. The essence of the renewal capability is the ability to create even radical changes.

... there is the paradox or contradiction that it may be that we improve in what we are doing. But there is this competency trap so that even if we improve in terms of what we are doing, it may be that we make it impossible for us to change. So we may improve intellectual capital by rehearsing and by trial and error and such things. But by improving we also possibly place ourselves in the competency trap so that, if things just change a little, we will not be able to cope with them. So I think it’s always a matter of the tensions between continuity and change that we have here.

Academic

Because if you want to create a company, which is very lean and doesn’t re-invent the wheel, you will not invent any other wheels either. On the other hand, if you only focus on innovations, you will probably end up being too costly in the end. So in this, too, it is essential to find a balance.

Business life actor

In relation to measurement, the data shows that while the financial result gives information only about events that have occurred in the past, the monitoring of intellectual capital is aimed at evaluating the prerequisites of achieving the strategic goals. Balanced scorecard can be seen as one tool for broadening the organisational
perspective beyond financial performance alone. It has its roots partly in the American tradition of measuring financial performance on a short-term perspective. This bias easily loses the long-term effects of retrenchments. With a balanced scorecard, companies are also forced to consider the longer perspective. Downsizing is a good example of shortsighted savings. Organisations lose an essential part of their intellectual capital as people are lost. Furthermore, those who are still employed are overworked by increasing performance demands. As a result, the remaining work community often faces severe problems.

And you can see that fairly clearly the companies that have downsized have a weaker performance afterwards. I think there will be quite conclusive evidence, when companies go through downsizing.

Business life actor

4.4 Health is seen ambiguously in relation to intellectual capital

Some of the experts interviewed on intellectual capital are unwilling to comment on the relationship between health and intellectual capital. It is also argued that intellectual capital is paradigmatically rooted in the management perspective, whereas an individual’s health is very much an employee perspective and, thus, these two would be incompatible with each other.

[TH]: … the eleventh question, which is about the relationship between intellectual capital and an individual’s health?

[interviewee]: I don’t know, I really don’t know.

Academic

I mean intangibles is very much a management perspective, like a balanced scorecard is a management perspective, human resource reporting models could either be a management perspective or an employee perspective. And an individual’s health is very much an employee perspective. Although, of course, you can see working conditions and things like that as important intangibles but I would say that the main difference is that intangibles is a management perspective, individual health is an employee perspective. Therefore, they don’t meet I would say, that’s two very different paradigms or movements behind them.

Academic

However, the relationship between health and intellectual capital is seen ambiguously in the data. It is also argued that, fundamentally, health can be seen as the determinant of how an individual’s competencies can be used in an organisation. In relation to intellectual capital, many interviewees see health as a broader issue than just physical health; it also includes mental, emotional and social dimensions. Health, in its broad meaning, is the foundation for an individual’s energy and ability. Performance expectations of modern business life require intense mental agility, but, at the same time, emotional balance and well-functioning social relationships. All of these are prerequisites for coping effectively in organisational linkages because the ability for autonomous responsibility requires a balance between all these dimensions. A person can be brilliant but sickness actually makes him incompetent, as he cannot contribute to
the organisation’s activities. Thus, health can be seen as a basic factor that has to be in order. Companies should also take care of this because otherwise more general development activities are meaningless.

It makes no sense to talk about any intellectual resources or any competencies in general unless there is the ability to change, or a sort of a vitality that forms the basis for individual’s ability to use competencies in the best possible way. In a way, it is something that companies should in part look after.

Renewal capability, which was discussed earlier in relation to work community and competence, is dependent on the relationship between the individual and the organisation. One of the interviewees argues that a poorly structured organisation suppresses the innovativeness of individuals. Monotonous work tasks with insufficient control over the requirements overlooks the hidden resources that people have. Employees get bored and their commitment to the task is low. On the other hand, hectic work pace is a strain and hinders development opportunities. Down-sizing, for example, is aimed at increasing efficiency but working with fewer employees can lead to exhaustion and sickness absences. Stress-related illnesses could also severely hinder work ability or at least the ability to be creative. Active work, that provides the opportunity to use one’s competencies and individual development, contributes to mental wellbeing, motivation and job satisfaction whereas long-term mental strain even causes physical symptoms. A practical guideline for development activities could be to consider whether the organisation is able to achieve its goals more efficiently and, at the same time, also reduce the strain on communities and individuals.

… we talk about mental wellbeing, which takes us into situations where being mentally exhausted results also in physical symptoms and sickness absences start accumulating etc. (…) I say last but not least – one thing is worth remembering – we can force people to work when they do not have another job and pay and treat them poorly etc. in the short run. But if we want to keep people satisfied and able to work, we should be able to show that they are important members of a successful enterprise. (…) it comes as a side product of knowledge management that people have a better work ability and they are better motivated.

5 Discussion

Table II presents the reconstruction of the findings in the results section above.
The current IC framework from an MWA point of view

- Organisation’s knowledge base is in the core of its business activities. Intellectual capital is primarily about how the knowledge of employees is applied in the firm.
- Human capital makes investments in competence as relevant as financial investments because an organisation’s renewal capacity is dependent on employees’ ability to create new knowledge.

Organization’s knowledge base is in the core of its business activities. Intellectual capital is primarily about how the knowledge of employees is applied in the firm. Human capital makes investments in competence as relevant as financial investments because an organisation’s renewal capacity is dependent on employees’ ability to create new knowledge.

Insights of MWA that are beyond current IC framework but are potentially relevant for knowledge

- Deficiencies in work related competencies could turn into serious problems in work life.
- They can also be a health related threat because of increased stress.
- The competence dimension of MWA is targeted at alleviating these threats. Improvement of competencies helps to create a healthy organisation with a natural collaboration.

Deficiencies in work related competencies could turn into serious problems in work life. They can also be a health related threat because of increased stress. The competence dimension of MWA is targeted at alleviating these threats. Improvement of competencies helps to create a healthy organisation with a natural collaboration.

<table>
<thead>
<tr>
<th>Maintenance of work ability</th>
<th>Competence</th>
<th>Work environment</th>
<th>Work community</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The role of information and communication technology is to enable and support knowledge sharing by opening access to relevant information.</td>
<td>• Increasing the number of people participating in the planning processes improves organisation’s strategic abilities and makes it possible to decentralise decision-making.</td>
<td>• Tolerance for contradictions and systemic challenging of new ideas emphasise the importance of the work community atmosphere, social support and control over work tasks as prerequisites of work ability.</td>
<td>• Health, which includes mental, emotional and social dimensions, is a prerequisite for ability to take autonomous responsibility for work.</td>
<td></td>
</tr>
<tr>
<td>• Information networks also enable new kinds of inter-organisational collaboration.</td>
<td>• Leadership has to shift from supervision towards stimulating relationships. Open communication culture is also important.</td>
<td>• Increasing number of part-time jobs with rapidly changing contents leads to uncertainty in employees and this reduces innovativeness.</td>
<td>• Active work that provides opportunities for using competencies and personal development, contributes to mental wellbeing, motivation and job satisfaction whereas long-term mental strain even causes physical symptoms.</td>
<td></td>
</tr>
<tr>
<td>• Designing work environment so that it is ideal for knowledge creation supports creativeness.</td>
<td>• Ability to exploit radical innovations requires readiness to change.</td>
<td>• Tolerance for contradictions and systemic challenging of new ideas emphasise the importance of the work community atmosphere, social support and control over work tasks as prerequisites of work ability.</td>
<td>• Increasing number of part-time jobs with rapidly changing contents leads to uncertainty in employees and this reduces innovativeness.</td>
<td></td>
</tr>
</tbody>
</table>

Poor industrial hygiene, occupational accidents and illnesses are costly to organisations. They also affect wellbeing and, thus, innovativeness.

Increasing knowledge-intensiveness of working life causes ergonomic challenges but also mental strain because new ways of working have to be adopted. Technical malfunctions are also a strain on employees.

Tolerance for contradictions and systemic challenging of new ideas emphasise the importance of the work community atmosphere, social support and control over work tasks as prerequisites of work ability.

Increasing number of part-time jobs with rapidly changing contents leads to uncertainty in employees and this reduces innovativeness.

Table II Reconstruction of the current IC concept and its limitations in the light of the MWA framework.
Analysing the IC experts’ interview data from the competence perspective shows how attitudes towards competencies have shifted increasingly from seeing them as an individual’s resource to a collective phenomenon. Earlier the competencies were seen as a static set of resources that an individual possesses. Considerable efforts have been made to try to develop new competencies through training. The dynamics of the knowledge creation perspective as an element of knowledge management have shifted the organisational focus to look for strategic niches that could be filled. Organisations are not tied as strongly to the past but sustainable economic performance is increasingly dependent on the ability to perceive new opportunities.

The original idea of including competence in the maintenance of work ability framework was to support employee performance whereas the intellectual capital discussion aims at using the different knowledge resources of an organisation in the most efficient way to secure value creation. Even though these approaches superficially seem quite different from one another, there is an underlying perspective that is characteristic of both, that is sustainable economic development, which was discussed in the description of the MWA framework. The MWA approach sees competence development as a way of relieving the harmful effects of rapid changes in the business environment from the employees’ perspective. IC discusses the same, but from the organisational perspective. Seeing these parallel roots behind both approaches show that there actually is no conflict of interest, because both organisations and employees are dependent on each other.

Information and communication technologies as an element of the work environment have been a central facilitator for increasing organisational flexibility. The increased ability to distribute different kinds of information fast and cost-effectively has made it possible to organise tasks in a way unimaginable without modern information and communication technology based tools. The change in information flows is not restricted to inside organisations but it also covers external structures. An emerging trend in relation to the work environment is the search for work places ideal for creativeness.

The approach of creating work environments optimal for innovativeness and knowledge creation is quite distant from removing biomedical health hazards. This development shows explicitly how dramatic the changes in the nature of work have been along with increasing knowledge intensiveness. Yet even recent studies show that more traditional approaches to the development of work environments are also needed, because “old” threats are still found. At the same time, the increasing use of information technologies also creates new challenges in relation to ergonomics, for example, unless there is proper planning and training for using new tools.

As was seen above in the description of the theory, MWA theorists have discussed the problems of information systems usability, such as system failure, but this perspective was not discussed in the IC interview data. However, sustainable economic development was discussed in the data in relation to shirking information technology investments. Again it is interesting that the emphasis even here was on the fluency of the process and thus economic results instead of the strain caused by the need to use obsolete tools.
A completely new kind of autonomy of employees is needed in modern business life and, thus, the traditional bureaucracy based leadership paradigms are losing their significance. The requirement of change in the leadership paradigm was clearly evident when looking at the interview data from the work community point of view. The leadership style that emphasises collaboration turned out to be the most essential element in shifting towards collective dimensions of the competence. Organisation-wide collaboration is the key for both perceiving the changes taking place in the operational environment and generating the dynamics of change that are required to meet the new challenges of the environment. Requirements for different leadership practises are also seen in the MWA approach. This is a notable parallel because the change in the leadership paradigm was so clearly seen in the data. The new power structure places the work community in a central role in organising tasks.

The work community has an important source of social support and sense of communality. According to the MWA theories, a well-functioning work community is an efficient buffer that makes it easier to adapt to rapid changes in working life. This point of view is also very well in line with the demand for the organisation’s renewal capability. It can be argued that the work community element of the MWA approach is well in line with the responses of the IC experts.

The controversy of health as a theme in the interviews is even somewhat surprising. The sharp distinction between the employee and management perspective seems problematic because of the strong interdependence between organisations and its employees. Employees essentially constitute organisations and employment is a status obtained through a membership in some organisation. One does not exist without the other but they are both needed.

In those comments that considered this perspective important, health related issues were strongly seen in relation to the capability to act as a member of the work community. It was also pointed out that the relationship is not simply a causal one, but good health improves work performance and, on the other hand, active and well-organised work also contributes to an individual’s health.

Discussion around work related stress that was found in the data took very similar angles as the MWA theory. However, it is important to note that it was one single interviewee that made these comments. Yet this finding is extremely significant because preventing occupational stress and burnout have recently been central themes in the development of MWA. This would suggest that maintenance of work ability is focusing on areas that are highly relevant for intellectual capital. However, the data of this study was scarce in this relation and it does not allow further elaboration of this relationship.

6 Conclusions

In the industrial age, the economic implications of different occupational safety improvements and other development were the focal point of view because this approach suited the logics of seeking improved cost efficiency in production. In today’s business world, as the logic of business activities is moving towards increasing knowledge intensity, the importance of employees’ comprehensive wellbeing is
becoming increasingly important. If wellbeing related issues are neglected, the prerequisites for innovativeness and knowledge creation are seriously weakened. Of course, this is a challenging task because, at the same time, competition in the market is constantly becoming stiffer. However, innovativeness is the core of the companies’ capability to survive in the complexity of the modern business environment.

Including the perspective of health in the discussion around intellectual capital means that we consider the individual’s capacity to undertake work tasks. For example, work site health promotion can result in reduced sickness absences. However, merely being present is not enough, but an employee must be willing to operate as an active member of different networks. This activeness requires willingness to both share one’s own knowledge and to learn from others. The activeness of the employees can be reinforced by supporting employees’ wellbeing through holistically performed maintenance of work ability in relation to the context at hand. On the other hand, the relationship between wellbeing and organisational performance is by no means a causal one because it has been shown that the organisation’s success also has a positive influence on the wellbeing of the employees. Work ability is observed to be lower in organisations that perform poorly (Jurvansuu et al., 2000a). Personnel wellbeing, organisational health and organisations success seem to intertwine in a complex way.

The multifaceted relationship between wellbeing and intellectual capital is modelled in Figure 3. Systematic scrutiny of the interview data showed that the most essential change has taken place in relation to competence. Whereas the focus has previously been on an individual’s competencies, the increasing importance of knowledge creation requires combining the characteristics of the individuals into a larger entity that can be seen as collective competence. The most evident development factor behind this is the increasing use of information and communication technologies that have made it possible to collaborate in whole new ways. On the other hand, the data revealed an emerging trend of designing work places that support creativeness. When considering the work community, the shift towards collective competencies has required a new kind of leadership paradigm that dissolves the bureaucratic chain of command into collaborative working practises. Even though the role of human capital as the fundamental element of IC has been widely recognised, the health perspective was far from self-evident in the data of the study. The most extreme respondents were not willing to contemplate this relationship at all, whereas some others stated that they have not given this a thought. On the other hand, one of the interviewees made remarks, which were very well in line even with the maintenance of work ability theories. Because of this ambiguousness in the responses, this linkage is described with a dashed line in Figure 3.
Wellbeing at work

![Figure 3 Logics of turning individual competence into collective competence](image)

The grey shading labelled as wellbeing at work in the figure above argues that all of these four linkage relationships described above are constituents of wellbeing. An ability to mould competencies residing in the individual employees towards a collective character is required in order to meet the rapidly changing requirements of the business environment. The linkages specified in this study have an essential role in supporting this conversion. Mismatch in any of these causes a strain that can prevent the creativity of the organisation. As mentioned earlier, there are some authors that have approached wellbeing in relation to IC to some degree, but no rigorous framework has been used in building the argumentation. In this study, the relationship has been examined by taking maintenance of work ability as the conceptual framework.

Figure 3 makes it clearly visible how knowledge management is fundamentally more than just about information and communication technologies. Conversion of individual competencies into a collective character can evidently be seen as the main target of the whole knowledge management movement. Information and communication technologies have an essential role in enabling this change, but other processes on different levels are needed simultaneously. For example, merely introducing new systems is not enough, but some kind of impetus for using them is also needed. This can be, for example, through easing the workload by more efficient access to useful and maybe even previously unavailable information.

The significance of wellbeing in relation to intellectual capital is strongly linked to knowledge creation. However, the interview data on IC experts cannot give a more specific insight into revealing this relationship than that presented in Figure 4. Therefore, it is suggested that future research be done into the views of wellbeing experts, which could be scrutinised from the knowledge creation perspective in order to create a more illuminative insight into this connection.
References:


QUESTIONS ON INTELLECTUAL CAPITAL

1. How would you define intellectual capital?
   • What old concepts has intellectual capital replaced?
     • Is this just a new form of old knowledge?
     • Which are the essential new issues that have arisen?

2. What factors influence intellectual capital?

3. How can intellectual capital be improved?

4. Can intellectual capital be measured by one instrument?
   • By what / why not?

5. What is the best indicator of intellectual capital?

6. What is the relationship between a company’s financial performance and intellectual capital?

7. Is intellectual capital related to the company’s financial performance in the short run or the long run?

8. Can there be situations where financial performance is improved but intellectual capital is weakened?
   • What are these situations?

9. Are you familiar with the Balanced Scorecard?
   • Does BSC describe intellectual capital?
   • In what sense (example)?

10. Are you familiar with Human Resources Reporting models?
    • Do Human Resources Reporting models describe intellectual capital?
    • In what sense (example)?

11. What is the relation between intellectual capital and an individual’s health?
MAINTENANCE OF WORK ABILITY FROM AN INTELLECTUAL CAPITAL POINT OF VIEW

Tomi Hussi

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Abstract

The traditional approach to evaluating the business economic implications of occupational health and safety has been the evaluation of productivity losses caused by sick leave and occupational accidents. In a knowledge-based economy this approach is insufficient. To meet this challenge, the interview data on maintenance of work ability experts is analysed from an intellectual capital point of view. The paper shows that the maintenance of work ability framework can easily be modified to meet the requirements of knowledge-intensive work. Seeing competence and the work community as the central elements instead of health, which has this position in the prevailing framework, maintenance of work ability supports organisation’s aim of creating use value that the customers are willing to pay for.

Key words

maintenance of work ability, intellectual capital, knowledge-intensive work, supporting individual’s work-related resources, empowering leadership, the link of social security system and employment rate
1 Introduction

Organisations and societies make considerable investments in occupational health and safety. The financial consequences of these investments on the socio-economic level are considerable. For example, an occupational accident that results in disability causes the loss of the rest of this individual’s work input and may also generate expenses in terms of the social security system. Health-oriented socio-economic studies form the majority of economic studies in the field (Ahonen et al., 2001; 2002). However, the tightening competition of the business environment forces organisations to control their cost-efficiency more efficiently. Therefore, there is also an increasing need for concepts that help to scrutinise the business economic implications of occupational health and safety.

The traditional approach to evaluating the business economic implications of occupational health and safety has been the evaluation of productivity losses caused by sick leave and occupational accidents (Oxenburgh, 1996). Evaluations of increased production efficiency resulting from improvements are also included, but no specific framework is provided for calculating these. In general, this approach is valid for the production-based jobs, in which the labour is unskilled.

The current shift towards a knowledge-based economy sets wholly different requirements on the work force. Lately, human capital has been adopted as the framework for analysing business economic effects (Berger et al., 2003). This approach is a logical consequence of the work site health promotion concept, which is a common framework for North American occupational health and safety. The aim of improving employees’ health relates to the discussion on human capital that is by definition an individual’s characteristic (see, for example, Edvinsson – Malone, 1997).

However, human capital is a rather limited framework compared to intellectual capital (IC) that includes the former as one of its elements. Intellectual capital is the central approach in the management studies as a framework for analysing knowledge intensiveness. The established definition of intellectual capital divides this concept into three dimensions labelled here as human capital, internal structures and external structures.

The maintenance of work ability (MWA) framework, which has been the dominant one for occupational health and safety activities in Finland since the early 1990s, is more comprehensive than work site health promotion. By the adopted definition, MWA includes health, as well as competencies, the work community and work environment. The point of this framework is to generate holistic development activities that simultaneously take into account all four dimensions of MWA. The comprehensive nature of MWA makes it possible to use the IC framework as a whole in the analysis instead of focusing solely on the human capital of the individual employees.

This study scrutinises the business economic implications of MWA by analysing it from the intellectual capital point of view. The data of this study consists of eleven interviews with maintenance of work ability experts and the three dimensions of intellectual capital constitute the theoretical frame of reference for analysing the data. Section two describes the intellectual capital theory and three the research design. Section four
presents the findings of the analyses from the human capital, internal structures and external structures points of view. Finally, section five concludes the paper by discussing the implications of these findings. Future research needs will also be provided.

2 Intellectual Capital

Intellectual capital is commonly defined as consisting of three parts. In this study, the three dimensional definition of intellectual capital has been adopted and these are labelled human capital, internal structures and external structures. This definition is in line with Sveiby (1997) with the exception of human capital that is used instead of employee competence. One of the reasons for this is that an individual’s health can be included in the previous one.

According to the value platform model the intersection of all three dimensions forms the basis for value creation (Saint-Onge et al. in Edvinsson – Malone, 1997). In the value platform model, knowledge management can be seen as a force that pulls different dimensions into closer interaction with each other.

Organisational change often becomes difficult due to an inadequate understanding of the complex whole, that is, dynamic system effects. It is the ability to develop an organisation in a holistic way that makes it possible to achieve really significant improvements in productivity. (Mouritsen et al., 2000.) The essence of the discussion around intellectual capital is the ability to give a holistic view of organisational development. If the elements are seen as separate from each other, the concept 'intellectual capital' has nothing new to offer. Different development activities directed at human capital have a very long history; the scientific management as a whole can be seen as an attempt to strengthen internal structures and marketing as a science also has a long history.

Even when two dimensions are very strong, the weak or inadequately directed dimension disrupts the value creation process. For example, the business re-engineering school that was highly endorsed in its time focused solely on organisational development, that is, internal structures, and ignored human resources, in particular (Eisenberg, 1997). Downsizing the organisation was, therefore, often used as a tool for attaining increased effectiveness. However, this creates severe uncertainty and also a competitive atmosphere in the organisation. When a work community deteriorates, the vitality of the organisation also crumbles. The holistic perspective of intellectual capital makes it possible to attain sustainable economical development in organisational development activities as all three dimensions are considered in a balanced way. The unbalanced settings are discussed in greater detail by Hussi (2001; 2004b) and Hussi and Ahonen (2002).

2.1 Human capital

In intellectual capital literature human capital is defined as the individual’s knowledge, experiences, capabilities, skills, creativity and innovativeness (Edvinsson – Malone,
These elements are connected to each other and collectively contribute to success in work (Ranki, 1999). Sveiby (1997), who uses the concept ‘employee competence’, defines it as a capacity to act in different situations to create both tangible and intangible assets.

The ability to perceive changes in the operational environment is also included in this category (Edvinsson – Malone, 1997). Learning is an individual’s development and adaptation to a changing environment. It requires the ability to control immediate work tasks, as well as the ability to improve functioning and a readiness to develop even qualitative features of work. (Salmenperä et al., 2000.) Attitudes are related to this readiness because they show what kind of stand a person takes in his or her tasks (Mayo – Lank, 1994).

The fact that a company cannot own its human capital distinguishes this dimension of intellectual capital from the other company resources (Edvinsson – Malone, 1997). Uncertainty about an employee’s commitment to the organisation reduces the organisation’s willingness to make these investments, especially if, as in many branches, the required skills are non-specific and transferable (Albert – Bradley, 1997). Yet, a competent personnel is the key in a company’s endeavour to realise and develop its business ideas (Hansson, 2001; Sveiby, 1990). Investments in personnel are seen as crucial for knowledge-intensive companies as industrial enterprises’ investments in tangible assets (Sveiby – Lloyd, 1987).

2.2 Internal structures

Internal structures are defined as including concepts, models, computer and administrative systems, and organisational culture (Sveiby, 1997). Edvinsson and Malone (1997) define internal structures, or structural capital as they call it, as the work context, empowerment of employees, recruiting capabilities, development activities, motivating strategies, organisational culture, systems and tools enhancing knowledge flows, organisational competence, a company’s renewal capability, and practical knowledge including definitions and improvement of work processes.

It is the nature of internal structures that they accumulate as an organisation grows and develops (Sveiby, 1990). An organisation’s knowledge base accumulates in numerous daily decisions and experiences. These are stored in work processes, instructions, forms etc. resulting in organisational learning. Organisational culture can be seen as a consequence of organisational learning as it forms a shared framework for defining and solving problems. (Ranki, 1999.) Too strict social norms, organisational values and business orthodoxies enhance a dangerous equilibrium and, thus, nullify the benefits of diversity. Too strictly standardised functioning cannot meet the unexpected changes. Such rigidity is dangerous for an organisation because it hinders the organisation’s capacity to react to information obtained from different nodes. (Pascale et al., 2000.)
2.3 External structures

In the intellectual capital framework, the external structures include relationships with customers and suppliers, brand names, trademarks and the company’s reputation or image (Sveiby, 1997). Edvinsson and Malone (1997) use the concept ‘customer capital’. According to their definition, it consists of the strength and loyalty of the customer relationship. Such characteristics as satisfaction, durability, price-sensitiveness and the good financial performance of long-term customers are related to this category. Customer capital can be created by committing the customers to the company’s activities using time and resources. Trust is also a significant element in this process. What is most important is the enduring relationship between the seller and customer. These relationships are judged based on penetration, coverage and loyalty measured as a customer’s probability of continuing the partnership (Stewart, 1998). This study uses the concept ‘external structures’ because stakeholders like subcontractors, other organisations, consultants, training institutions and the public sector can also be included in this.

Different kinds of networks have always existed, but they have been more or less informal. The novelty in the new networking is that companies operate in these activities in an objective-oriented way. One essential reason behind this development is the reduced costs of information technology that makes information sharing cheaper and, at the same time, more efficient. (Stewart, 1998.) Due to the increasing need for networking, organisational boundaries lose significance. Collaboration leads to cooperation systems, such as virtual organisations, that last at least for a while. Therefore, the competition is no longer simply between different companies, but also different value chains. Value chains consist of suppliers, middlemen, service providers and manufacturers. Information technology can be used to improve the functioning of the value chain both inside organisations and between them. (Salmenperä et al., 2000.)

External structures also include the society in which an organisation operates. Depending on the field of industry legislation, for example, may have a considerable influence on how the organisation functions (Hussi, 2001; Hussi – Ahonen, 2002). Therefore the public sector, legislation and various societal actors are also taken into account in terms of external structures because they all have considerable influence on the organisation’s activity. For example, Haines and Bédard (2001) examined the effects of early retirement on intellectual capital creation. Their study showed that the outcomes of early retirement, even though enmeshed managerial decisions and circumstances, are harmful in terms of intellectual capital. According to this study knowledge creation is inherently a social process. Early retirement, in particular, is seen to be conducive to a lack of time to accomplish tasks and reduced opportunities to help other network members adapt to their roles. Furthermore the lack of personnel and employee mobility were observed to lead to job overload, sickness and burnout.

Having presented the theoretical frame of reference, the essay proceeds to analyse the actual research design.
3 Research design

The research question of this paper is: What are the economic characteristics of MWA from an IC perspective? This research question divides into two sub-questions: What is common for both frameworks and What areas of IC go beyond the current MWA concept but are relevant for work-related wellbeing?

This question is approached by analysing the interview data from eleven experts in the field of maintenance of work ability. The selection criteria for these experts were the high-level of expertise and as broad a coverage of different perspectives as possible. This approach made it possible to gather information from all the relevant institutions and organisations in terms of MWA. The distribution of interviewees according to their occupational backgrounds is presented in Table I. The interviews were conducted April - July 2000. The interview references are labelled in the findings section following the classification of the table below.

<table>
<thead>
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<th>Background</th>
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Table I Background of the interviewed maintenance of work ability experts

The interviews were performed following a predefined question structure, which can be found in Appendix A. The main idea in forming the interview structure was to present questions in line with the general MWA theory at the beginning and gradually adopt more unorthodox perspectives. The simultaneous collection of analogous interview data among intellectual capital experts also influenced the selection of the questions.

The next section presents the findings of the analysis of the interview data on maintenance of work ability experts with the three dimensions of intellectual capital as the framework of the analysis.

4 Findings

Below, the findings of the analyses on the three dimensions of intellectual capital are presented. The order of presentation follows the common structure of definitions on
intellectual capital, that is, human capital, internal structures and finally external structures. Besides the central role of human capital in relation to IC, it also stands out as a natural point of departure for MWA because work ability is ultimately an individual’s experience. Internal structures outline the organisational elements of MWA and finally external structures map the extra-organisational features that are relevant in the MWA framework.

4.1 Human capital point of view emphasises work-related health and competencies in the MWA expert’s interview data

When analysing the data from a human capital point of view, the interviewed MWA experts discuss individual resources a lot because it is argued that work ability is the combination of both an individual’s resources and the work requirements. According to the interviewees, the individual’s resources consist of health-related physical, mental and social resources, competence and attitudes.

Resources include health-related resources that integrate physical, mental and social aspects; and then competence resources, knowledge and skills; there are attitude resources, values and these motivational issues and job satisfaction. This is the set of resources. (…) In Germany they talk only about physical capacity and label that physical work ability. It is not the same, if you perform well on an ergometer, this provides no information about your work ability, but it has to be related to the work requirements. (…) Everyone is talking about this life-long learning that it would be same as work ability, that’s something that you hear everywhere. It is by no means work ability, but it is the competence module in this whole.

Research institute

The interviewees see that some fields of individual resources can be developed quickly. Skills that are closely related to work tasks or improving physical fitness are easily developed even over a shorter time. Improvement of muscular fitness can be an important goal in physically demanding work. However, according to the data, activities that have been undertaken as MWA have often emphasised physical exercise whether or not the work actually is physically demanding. This tendency is seen to have resulted from the MWA service providers’ background in occupational health care and thus other dimensions have received much less attention. Another reason for the established position of increasing physical activeness, which was observed in the data, was the ease of introducing such activities and measuring their effectiveness. The data shows that although the experts interviewed largely have a broad view of the concept of maintaining work ability, the actual activities have mostly emphasised physical fitness and therefore exercise as a means of improving it. This gap between theory and activities suggests that the MWA framework might have even more to offer in terms of supporting employees’ wellbeing but this would require a different approach in relation to the actual activities undertaken in practice.

… when the first plans came from this physiology approach, it was suitable that workplace exercising gets activated. Because it is so easy to organise and market as a concept, its importance is easily understood. (…) Physical exercise is in a way such a concrete activity and its effects are observable in the body and muscles. (…)

Research institute
But if we take a look at what has been actually done, we can see that most of the activities in the 1990s have focused on physical exercise. I would be really keen to see figures showing how much occupational healthcare resources have been spent in fitness testing and organising exercising events. (...) We are even in a bit of a language trap here. As long as we discuss work ability, everyone is thinking about these physical capabilities, sicknesses etc. And everything else like questions related to, for example, skills, competencies, the work community and tools are left behind.

Rehabilitation institution

Ageing is seen in some interviews as an important theme in this setting because it alters an individual’s essential work resources. For example, ageing decreases physical resources and competencies become obsolete, as well, unless they are constantly updated

(Among the ageing employees [T.H.]) it may be the case that a person has no specific illness but there are several smaller problems like back pain or neck tension, a bit depressed. And the basic education is not that good, only odd skills acquired in the work life that can be outdated quite rapidly. (...) so that they are practically disabled even though there is no observable illness that would entitle them to a disability pension, for example.

Labour market organisation

It is argued in the data that attitudes towards work may vary considerably because some think of certain features as stressful whereas others are highly motivated by them. Motivation is seen to depend on the perceived compatibility of an individual’s resources and work requirements. Cognitive processes define the way situations are interpreted, that is, whether they are seen as stressful or enhancing and, furthermore, how the situation is coped with and the decisions about continuing under these circumstances. In general, the interviewees see that people are quite flexible towards work requirements and they can endure stressful situations for even surprisingly long periods if they see it as a requirement for positive development. Therefore subjective impressions are seen as an important indicator for work ability.

... own subjective estimate of work ability in relation to my lifetime best. So an individual subjectively evaluates his own situation in comparison to what it was at its best. Second is that I evaluate both physical and mental work ability in relation to work requirements. So I’m personally asked to estimate what is my mental work ability in relation to the mental requirements of my work or physical work ability in relation to physical requirements. And the third is the estimated handicap of sickness in work. Is illness a work disadvantage or not. Does one have to change the way one works because of sickness? This has a high predictive value because there are many illnesses that have no effect in practise if suitable operations are performed here in work issues.

Research institute

Analysing the data from a human capital perspective also shows the relationship between work ability and private life. A balance between work and private life is seen to be conducive to wellbeing whereas disorder is erosive. It is argued in the data that even quite every day situations beyond the work context also affect how well an employee can focus on the tasks at hand.

... one must have a balanced life, an ability to control life. I think it belongs to work ability, as well. (...) sort of creative laziness in leisure time and really there must be other ways to tackle
this. This is really good. Things go too far when you have to catch up with your work during holidays. It is a sign that the central tasks are not structured clearly enough.

Research institute

If I had a car crash on my way to work, for example, walking through that door my work ability would be probably… I would just shake here for a while I suppose because that accident is more acute to me than this work community and everything else around here. So I probably would not be able to pay attention to all these good things here and perform steadily because I had this earlier accident on my mind.

Consultant

According to the MWA experts there are many companies in which human capital is the key to future success. It is argued that the importance of employees’ development and performance capability can be higher in some fields of industry than in others. In knowledge-companies the functioning is completely based on the effective functioning of competent personnel. The interviewees see that the variety of necessary competencies, for example, is increasing because collaboration requires communication and information technology skills and internationalising activities place increasing demands on language skills, as well. This development is argued to cause a considerable need for developing monitoring tools that enable the state of a company’s human capital to be measured. Monitoring tools should be able to relate findings to an organisation’s goals because in this way MWA activities would actually help carry out an organisation’s strategy.

… primarily I would imagine that it (work ability, [T. H]) is competence (…) There are a few people that have severe illnesses, in which case it is the illness that sets limitations. (…) these physical capacity issues can be compensated for by competence to some degree. (…) There are always all sorts of limitations when a person is employed. He either is competent in something or not. And then are all these health-related defects, but most of them can be overcome. So that the primary issue is competence in its broad meaning. If a person has intelligence, capacity and a suitable education, then it is quite expected that he can do the work unless a serious illness occurs.

Insurance company

… it means that employees’ competencies are in line with an organisation’s core competencies. And then are these wellbeing issues that will probably be a considerable development area because our personnel are ageing. (…) This model is different (in relation to the balanced scorecard (T.H.)) because Kaplan does not have these wellbeing issues here but there is only development and learning perspective and he does not observe these health-related issues here.

Insurance company

On the other hand, the scrutiny of different resources described above was also criticised in the data because it is argued to be disconnected from the actual work tasks. The criticism of the interviewees see that rehabilitation, for example, can bring good results in the short term but the effects can disappear because the original cause for rehabilitation is not tackled. The easy approach of solely improving an individual’s resources is seen to have a rather modest influence on work ability as a whole. According to the critical voices the difficulties in realising the complexity of this process have resulted in a bipolar perception of work ability, in which there is the
employee and all his abilities, characteristics etc on one side and the work and its requirements on the other. The problem is seen to arise from these two being seen as separate from each other. Furthermore, development activities undertaken by actual companies have mostly focused on everything but the work itself.

… they (the four corners of MWA tetraedre, [T. H.]) were sort of dismantled from the context into separate targets of influence. (…) because this phenomenon is synergic by nature, it was disintegrated when separated from the context. (…) And I would put it this way that when we took this as a starting point, that is an individual and health and models related to those, I do think that taking physical activities as a starting point is a burden here, absolutely. (…) If the work community had been taken as the starting point… If we had realised, dared to start, work communities would have immediately started to consider their own terms of wellbeing. (…) people are somehow, when all this has been performed as MWA, they are a bit discontent. They are expecting, without saying it aloud, that the work atmosphere would improve somehow. To me this shows that our approach has not been valid in that sense.

Research institute

4.2 Internal structures determining the work load in the MWA interview data

Analysing the MWA expert interview data from an internal structures point of view emphasises effective collaboration as the highest priority for organisations. According to the interviewees this results from the requirements of the modern work life, which make organisations dependent on group level capability. Connectivity in different organisational social networks is seen in the data as an important determinant of work ability.

… this competence to really use social networks. It is obviously a basic factor of wellbeing. Therefore, when many people are entering a new workplace, they have a phase, that even though they were extremely skilled in professional terms, they lack this social competence. The more complicated the work, the more difficult it is to get started and they even feel inadequate. Therefore the network has to be recreated, but the introduction is rather superficial – they show some new faces and that’s it. On the contrary, professional training is provided even though training in these social networks is needed much more. That’s the way it is, which is also an important determinant of this work ability.

Research institute

One of the interviewees argues that the importance of collaboration shows in innovativeness that is the key to an organisation’s renewal capability in meeting the requirements of the changing environment. In general, the interviewees see it as characteristic of this change that it is strongly related to the application of different information systems in an increasing number of work tasks.

… developing new products in order to survive in a constantly changing environment. If this stalls for a longer period, others start overtaking (as competitors are able to come up with more sophisticated solutions [T.H.]). Regardless of how good the organisation’s production and business idea is, this has no long-term consequences unless it operates efficiently and is full of ideas.

Research institute
... even in more traditional industry and manufacturing the world has changed so much that robots handle an increasing part of the actual work and humans are needed more for supervision and maintenance, to make sure that things run smoothly, and if there is an error or problem, to fix it. So, even in those cases work is increasingly interaction. And if there are problems in communication and the atmosphere is poor, it directly affects work, too.

Labour market organisation

It is argued in the data that the inability to perceive development needs caused by changing operational environment leads an organisation to continue with old practices while the work target is actually completely different. Employees can often overcome production problems to some degree by making more effort. The interviewees consider it typical that all the more demanding tasks stress individuals beyond the optimal level from time to time, but enduring an excessive burden is argued to be harmful because it erodes resources. It is argued in the data that the more poorly changes are managed, the more employees have to struggle with their mental and physical condition.

this division into departments and positions of the employees were all built around the old concept of an old people’s home that was designed in the 1970s. According to this logic it is a place for the healthy elderly to live in their own rooms and the staff is there to take care of cleaning, cooking and some minor health care, like taking blood pressure. But nowadays, the elderly living in these houses are completely different. They have severe deficiencies in relation to both physical and mental capability because of dementia etc. This mismatch of requirements and work methods results in the employees’ considerable difficulties in carrying out the tasks. (...) The change is unchecked because the organisation tries to continue with the old patterns in a totally different environment. (...) if the employees’ problem is that they are using old work methods to work with new kinds of customers, it is very hard and produces poor results (...) the more poorly these development needs are met, the more employees must struggle with their mental and physical condition.

Rehabilitation institution

The interviewees see that different social activities have been much used in Finland to increase the sense of togetherness in work communities. Very often these events have also included some sort of exercise, like sports days. It has been shown that these events have a relatively small influence on work ability, especially in the long run. Successful events may temporarily increase enthusiasm in the work community.

These communal activities that actually don’t have any or at least a very loose connection to work – the only common characteristic is the same employer – they are these events. In Finland there have been very many MWA events or sports days. (...) These events, at best, increase the communal spirit a bit. However, the problem is that not everyone attends them.

Consultant

Instead of occasional organising different events, the interviewees argue that successful MWA is actually a long-term investment. According to them the more lasting results of a development only emerge after persistently undertaking various activities. It is argued in the data that the basis for MWA activities in an organisation should be the decision in the work community to start developing the wellbeing of its members. The interviewees underline that supporting wellbeing is not a project as such but more a constant ongoing process that has to be integrated into an organisation’s culture in order to be considered in daily work. A well-functioning work community is able to take care of its members’
wellbeing. Accordingly, smooth daily functioning makes it possible to reach better quality and productivity. Thus work ability is seen to derive from the actual work results.

… the better organised the work, the better you can organise it, the better tools you have to control your tasks, you can be sicker and still cope with your work. And vice versa, when work requirements are strict enough, even the smallest health problem makes you unable to work.

Rehabilitation institution

(Such occupational accidents that have caused death [T.H.] that should have been removed like twenty years ago; simply unnecessary risk-taking and these issues have been neglected. It is the nature of occupational safety that if you don’t constantly keep it in mind, it is easily forgotten. (…) when you think from an organisation’s point of view, work ability is related to an individual’s capability to perform work tasks. Then it is unavoidable how much an employee is present and what results the work produces.

Insurance company

It is stated in the data that planning successful development activities is characterised by the participation of the whole work community. Such an approach requires empowerment-oriented leadership style that ignites discussion-based planning. According to the interviewees the planning should aim at a shared conception about the goals that are relevant in terms of the organisation’s strategy. Openness towards input from the whole organisation is argued to be important because a smaller group may have a rather limited perspective about the development needs. Furthermore, everyone should know the goals and their role in pursuing them. On the other hand, the interviewees see that successful development is not only about collective planning, but it also often requires adopting new ways of working and changes in values and attitudes. The data shows that leadership skills are required in inspiring the employees’ commitment. It is argued that uncommitted personnel are unable to come up with innovations and they are not possible in the atmosphere of excessive pressures, either.

I would take the idea of subjectivity and empowerment as a starting point here. This is like: "In your opinion, what should be better here so that your wellbeing would be improved?" (…) So I would take here, instead of mechanical causality thinking that is characteristic of natural sciences, an approach to strengthen the solution-oriented subjectivity.

Research institute

4.3 The analysis of the MWA interview data shows that external structures should be broadened from occupational health services to a variety of actors to meet the demands of knowledge-intensive work

The data shows that MWA issues have traditionally been the responsibility of occupational health care.

… that in Finland, for example, occupational health care has been both preventive, carrying out individual health inspections and workplace evaluations for organisations, and secondly treating illnesses. However, many line workers actually see that this general health care, which is voluntary and not mandated by law for the employers, but many people think that this health care is the most important part if not actually the whole of occupational health care. But the law
on occupational health care is precisely about these preventive services. (…) and also the history of health care may be different. Maybe some other countries emphasise more occupational safety techniques, whereas this Finnish service model is doctor- and nurse-based.

Labour market organisation

According to the data the emphasis on medical orientation might result from the Finnish social security system, which is on the whole seen to be considerably medically oriented. Thus health improvement would be a logical approach to reduce the effects of illnesses. According to the criticism of the interviewees the social security system as such is not about evaluating employees’ ability to work but whether they are entitled to social security benefits, or in other words a disability pension. This historical background is argued to have characterised MWA as being medically oriented because the right to such benefits is regulated in health insurance legislation and based on a medically diagnosed illness or handicap.

Because of the social security system such problems transform or get reduced to neck and back pain, exhaustion, depression and so on. (…) there is no conspiracy of exercise protagonists but I see this as the natural consequence of the changing social benefits system.

Rehabilitation institution

The interviewees see that because of its close relation to the social security system, the maintenance of work ability is characteristically seen as a tripartite consensus in Finnish society. One of the reasons for the importance of tripartite decision-making is argued to be the high level of unionisation in Finnish work life. The labour market and pension insurance company representatives, in particular, discuss that illness as such does not prevent working if the individual, company and society are willing to solve the situation. The interviewees see that on an individual level the question is about motivation and attitude towards work. It is argued that companies can do much, for example, by developing the division of labour to meet reduced capabilities and finally society influences this setting through employability related policies. Accordingly, the grounds for social benefits can be altered by political decision-making that focuses on employability solutions. These include pension, work and education policy and legislation. The interviewees note that there have been attempts to reduce the consequences of structural changes in society by introducing new pension models. The introduction of new retirement schemes is seen to have also loosened social norms that regulate attitudes towards participation in the work life. According to this view there is a considerable trend in Finnish society of people being willing to leave work and spend more time on leisure activities.

When it became possible to benefit from the social security system, suddenly the number of pensioners doubled. This development clearly shows that this is not only about health because illness does not occur at that point but it is the changes in the social security system.

Labour market organisation

The rate of early retirement is increasing. But I’m not quite convinced if it’s purely work ability related problems that are behind this. OK, they supposedly have increased as well but there is also a considerable change in the way people think. (…) even quite healthy people think that they have given their fair share and it would be nice to do something else while still healthy and, in principle, able to work.
Insurance company

It is argued in the data that the generations entering work life are getting smaller after the baby boomers, and this was expected to result in a labour shortage unless action was taken. According to the interviewees a common approach to tackle these challenges has been making it more difficult to get social benefits, but in Finland, the pursued strategy is argued to be quite different because a national consensus took place aiming at supporting employees’ ability to continue working.

In many other countries this situation [increasing the retirement rate (T.H.)] has been tackled in a very different manner but we have acted quite exceptionally in relation to any other European country in this fight against disability pensions, if such wording can be used. All other countries have made the definitions stricter and practically closed the gates (…) we ended up with this solution in that we try to influence the work ability and that evaluation process and thus rationalise it without changing the definitions. That is actually without making retirement more difficult in a legal sense. (…) the work ability index and other things were created, the study by the Local Government Pensions Institution originated precisely from the worry that there are these occupational pension ages and this problem was already identified because people are retiring too early. We observed that employment rate is too low and we adopted the approach of work ability to determine disability – I would imagine that this is very much the reason.

Insurance company

On the other hand, according to the interviewees globalisation toughens competition across national borders and a highly competitive environment is seen to increase the demands for organisation’s innovativeness to meet development pressures caused by the competition. In occupational health care, the connection with training experts, for example, has not been that strong. Modern work life is argued to be so complex that different perspectives have to be joined to create a more detailed understanding. According to some of the interviewees the different experts, consultants and occupational health care all have an important role in the development of work life.

Usually MWA experts are linked to occupational health care. They are not experts in competence and training and professional development. (…) collaboration with personnel and external experts, like occupational health care but possibly also other external experts would create a comprehensive personnel plan that would include goals and means for improving occupational health and safety. A plan for occupational safety, an occupational health care contract, training scheme and in all these there would be an individual’s and work community’s point of view. (…) This would provide strength and tools and would make the planning easier.

Labour market organisation

In the data the relationship between MWA and profitability is argued to evolve through customer relationships. According to the interviews, personnel that are unmotivated, incapable, incompetent and in poor condition cannot perform tasks with good results whereas positive development gradually brings improved results in improved customer satisfaction and market share and thus, furthermore, in an improved economical result. However, there are also opposite effects because the quality of the customer relationships also shapes the employees’ work ability. The future prospects are realised in new orders, customers and increasing market share. Favourable prospects are argued to strengthen the employees’ feeling of secure employment.
… all this various hassle and hurry, these are the symptoms that quite often indicate that things are not right in an organisation. It can also be seen in customer contacts and many such issues. So it leads in many ways to this image that customers and investors have of an organisation. (…) The importance of customers to work ability is clearly that the kind of customers you are involved with shapes the way you operate. The more challenging customers you have, the more it forces you to develop your own activities. (…) There can be situations in which your competence simply is not sufficient (…) daily it either is possible for employees to sense achievement and mastery over the tasks through customer relationships or not. (…) it is an image matter for an organisation. Information spreads surprisingly well about where these issues are in order and where not.

5 Discussion

The reconstruction of the results discussed above, and also the insights of IC theory that go beyond the current MWA framework in terms of work-related wellbeing, are presented in Table II. The findings of the study indicate that both MWA and IC take a comprehensive view of the development of work life by tackling it as a multidimensional phenomenon. The insights of IC theory that go beyond the current MWA framework, but have relevance in terms of work-related wellbeing, emphasise the organisational renewal and logic of value creation. IC is characteristically a proactive approach to anticipate future needs whereas MWA is more of a reactive framework by nature. This difference is reflected in all three dimensions of analysis in this study.

In general, the analysis from the human capital point of view reveals the emphasis on an individual’s resources in the MWA framework, because work ability is seen as the compatibility of an individual’s resources and the work requirements. The data elaborates essentially the concept of health in terms of MWA by showing that it is the work-related level of health that is the focal point of view. This is different from health as such because it is related to the specific context. Instead of evaluating general functional capability MWA focuses on the individual’s productive capacity. Furthermore, it is argued that health is intertwined with many other types of resources. In the IC literature, health is more like a nuance (see, for example, Brookin 1996, Edvinsson 2002). Similar findings were gathered from the IC experts’ interview data examined by Hussi (2004a). The findings above deepen the insight on the relationship between IC and health.

The relationship between work ability and an individual’s private life is another theme that has not been considered in terms of IC. Since increasing knowledge-intensiveness places higher demands on an employees’ cognitive capacity, it seems clear that the balance between work and private life must be sustained. If work is increased at the expense of leisure, this will certainly affect the chances of recovery, for example. In the longer run such short-term effectiveness will be negative in terms of decreased innovativeness. However, this line of reasoning brings us to the idea that private life is a balancing factor and a source of recreation and a complementary element to health on the work level and does not relate to other dimensions of work ability. Yet, it is obvious that various hobbies like language studies can also be valuable concerning work.
The current MWA framework from an IC point of view

- MWA stresses supporting individuals’ resources in order to sustain the work requirements.
- MWA, which includes competencies, is more compatible to the IC framework than work site health promotion. However, the actual activities executed by the organisations seem to focus on improving work-related health.
- Criticism of the resource view argues that the above-mentioned resources are seen as separate targets of influence. They emphasise the interdependence between different resources. This is also more in line with the IC theory.

Introduction of new ICT tools facilitates communication but efficient use also requires changes in other areas of the work community.
- Inability to meet development needs and thus continuing with obsolete work methods causes stress in employees.
- Empowerment emphasising leadership is important also in relation to MWA because identification of development needs the participation of the whole work community. Employees’ control over development activities also makes commitment to changes easier.

Occupational health care service is a central external structure because MWA has been closely linked to the social security system, which is built around medical-based orientation.
- Changes in the social security system have loosened social norms concerning work participation. This is a problem because ageing of the labour force is expected to lead to a shortage of labour.

Insights of IC that are beyond the current MWA framework but are relevant for work-related wellbeing

- The role of tacit knowledge, which accumulates along with age, is central to IC.
- Collaborative skills are also shown to increase along with age.
- These points of view highlight the importance of older employees for an organisation in a new way.
- Context-bound nature of knowledge links human capital inseparably to the organisation.

IC provides a proactive approach to competence development because the creation of new knowledge is essential to it. In MWA, development aims at solving observed competence gaps to maintain sufficient resources.
- In the IC theory the physical and cultural infrastructure is built around the aim of enhancing knowledge sharing to create innovations. MWA emphasises developing the work context to overcome the threats to wellbeing caused by obsolete processes.

The expertise base of MWA must also be broadened from occupational health care to other fields because of changing requirements that are challenging wellbeing. Networking covers a multitude of different perspectives and thus provides insight into new actors relevant in terms of employees’ wellbeing.
- Dissolving organisational boundaries makes it harder to undertake MWA activities. Collaboration is based on contracts that can require compromises, which can possibly even endanger wellbeing.

<table>
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<th>Human capital</th>
<th>Internal structures</th>
<th>External structures</th>
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| Table II Reconstruction of the analysis’ results and insights of IC that are beyond current MWA framework but are relevant for work-related wellbeing | |
|----------------------|----------------------|----------------------|
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| The role of tacit knowledge, which accumulates along with age, is central to IC. | IC provides a proactive approach to competence development because the creation of new knowledge is essential to it. In MWA, development aims at solving observed competence gaps to maintain sufficient resources. | |
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| These points of view highlight the importance of older employees for an organisation in a new way. | | |
| Context-bound nature of knowledge links human capital inseparably to the organisation. | The expertise base of MWA must also be broadened from occupational health care to other fields because of changing requirements that are challenging wellbeing. Networking covers a multitude of different perspectives and thus provides insight into new actors relevant in terms of employees’ wellbeing. | |
| | Dissolving organisational boundaries makes it harder to undertake MWA activities. Collaboration is based on contracts that can require compromises, which can possibly even endanger wellbeing. | |
In the data, the traditional MWA approach of focusing on health and especially physical fitness is challenged by the increased importance of competences, which some of the interviewees argue to be the most central element. The linkage between competence development and an organisation’s strategy is sophisticatedly elaborated in the MWA experts’ interview data. This finding is actually astonishingly similar to the IC framework. On the other hand, this observation shows the considerable difference between maintenance of work ability and the work site health promotion framework, which is common especially in Anglo-Saxon countries. Work site health promotion is aimed only at improving employees’ health-related resources (see, for example, Berger et al. 2003). Maintenance of work ability is designed to be a holistic model for occupational health and safety activities that is aligned to the strategic planning of an organisation. As the work requirements increasingly include a greater demand for a new variety of competencies and creativity, they are becoming more important elements of MWA from a human capital point of view.

The observations of critical comments on resource improvement state that these resources are seen as separate targets of influence that are detached from the actual work tasks. This would suggest that even though MWA has been designed as a comprehensive framework for the development of work life, it is still missing the holistic approach in a specific context that would bring out the synergetic advantages of the development activities. The key for establishing synergies is argued to be the systematic evaluation of work requirements. Accordingly, the synergetic nature of different elements is also at the core of human capital in terms of IC theory. In this sense, the critical observations have much in common with the IC framework.

In the data, the negative consequences of ageing are discussed because it is seen to weaken an individual’s many resources, especially health. The weakening of other resources, like competencies, is linked to health, because lack of skills also causes stress. The creation of new knowledge is a central theme in the IC framework. From the human capital point of view the importance of tacit knowledge and collaboration skills are emphasised in terms of knowledge creation. Sveiby and Simmons (2002) show that ageing is better in terms of a collaborative climate. Tacit knowledge, which is personal and difficult to share with others (see, for example, Polanyi, 1958; Nonaka – Takeuchi, 1995; Sveiby, 1997; Hussi 2004b) accumulates with age, as well. These points of view open up important aspects on the positive effects of ageing. Older employees with their accumulated tacit knowledge and better abilities to collaborate are an important strength in the process of knowledge creation in an organisation.

The internal structures point of view on MWA data can be summed up as the description about the context of work that shapes the workload of employees. It is characteristic of the findings that they focus on the processes of collectively identifying and solving problems related to work tasks. In the IC framework, the internal structures emphasise the collective abilities of knowledge-sharing and accumulating the organisation’s knowledge base.

The data highlight the importance of effective collaboration as a prerequisite for meeting the changing requirements of the modern work life and therefore the work community is seen as a cornerstone in the MWA framework. It is argued that neglecting
the needs of development results in obsolete work processes that can be harmful to the employees’ wellbeing. The stress mechanism, in which the inability to meet development needs leads to situations where employees have to push harder with existing resources and focus on mechanical efficiency instead of creativeness, opens up a new and possibly even more dangerous perspective on organisational orthodoxies than that discussed by Pascale et al. (2000). Besides paralysing innovativeness, such a stressful situation degenerates resources further and thus destroys the future capability to innovate.

The approach of organising different social events as MWA, which has been a rather common approach in Finland, is argued to have little influence. It would seem that the approach of organising different social events is more like just another attempt to improve resources, which are in this case social skills and also, again, physical fitness, especially when considering sports days. Because of the deep-rooted nature of development activities, organisations should make a long-term commitment to maintain work ability. This will not happen by just focusing on the dimensions that are easily improved but, because of the synergetic nature of MWA, it must be considered as a whole. Development activities targeted at the work community, for example, should accordingly have a conscious approach to enhancing the cohesion of the work community instead of just providing an opportunity to make new acquaintances. With careful planning social activities could be developed into building new relationships between individuals, and thus knowledge sharing would be facilitated. Thus this approach would also be beneficial in terms of IC.

The introduction of new information and communication tools discussed in the MWA experts’ interview data is also a central theme in IC literature. As it was seen on the results section, simply introducing new information and communication systems is insufficient, but development must also take place in other areas of the work community. Successful development of the innovative practices requires organisation-wide participation in both planning and undertaking the actions generally agreed upon. Empowerment emphasising leadership style is seen as the key to openness for input from the whole organisation and inspiring the employees’ commitment to changes. In IC theory, leadership emphasising empowerment lays the foundation for knowledge creation. The essence of IC is of a similar systemic nature that requires the interaction of all the dimensions combined into a dynamic whole and therefore this approach is well in line with IC theory. This finding suggests that simply taking care of an individual’s resources, which was discussed in the previous section, is not enough. As shown by Hussi (2004a), work-related wellbeing is central for successful knowledge management. In terms of knowledge-intensive work, work ability is a phenomenon in which collective features combining an individuals’ potential into a greater entity are elemental.

In terms of external structures, the occupational health care service stands out as the central external structure. The interviewees see the importance of occupational health care service as a possible result of Finnish social security legislation that restricts the focus to a medical-based orientation. It is argued in the data that the close relationship to the social security system has shaped the MWA framework towards supporting individuals’ resources, that is, features discussed in the human capital point of view. According to the criticism of the interviewees, individual resources are centrally related
to physical health and this is argued to have caused the medicalisation of the whole MWA. In their view, the work life changes taking place in modern society also cause different needs for MWA. Work ability cannot be defined simply as sufficient resources to meet the work requirements, because it is characteristic of modern work life that these requirements are also constantly reflected. This development is argued to increase the demand for MWA activities discussed in relation to internal structures because a well-functioning work community is the key to reflecting the underlying structures constituting the work logic. Because of changing needs, the variety of service providers active in MWA must also be broadened. It was discussed also in the data that there is a need for combining different perspectives for creating a better understanding of the complexity of modern work life.

The considerations of occupational health care services are quite different from the IC framework that focuses particularly on the customer relationships. This is a natural consequence of finding that health as such is not a common theme in terms of IC. However, as was discussed above, work-related health is also relevant to IC. Therefore, occupational health care services are identified as a new important actor in the field. Although there was some discussion in the MWA data about the customer relationships, the emphasis on inter-organisational purposeful networking, which is characteristic of IC theory, was not discussed. In general, the connection between MWA and the improved performance of an organisation remains unclear based on this examination.

The MWA experts interviewed discuss much about different policies that influence employability. Thus, labour market organisations and state authorities stand out as important actors in MWA. This characteristic is very different concerning the IC theory that focuses on innovation creation through extra-organisational relationships. However, the formation of the social security system is controlled by these institutional actors of employment policy. This finding provides a new angle on the argument that external structures should be seen as a broad concept also covering the society in which an organisation operates (see Hussi 2001; Hussi – Ahonen 2002). Besides occupational health care services, labour market organisations and state authorities also stand out as relevant external structures.

The ageing of the labour force and societal attitudes towards work have not been commonly approached in the IC theory. Yet these have a considerable effect on employability and thus the availability of human capital. It is argued in the data that the changes in the social security system have loosened the social norms controlling participation in work life. As it was earlier discussed in the human capital section, an ageing labour force possesses relevant abilities, such as tacit knowledge and improved collaborative skills, making them an important resource for organisations. On the other hand, the expected labour shortage also creates increasing demands for a higher employment rate. Therefore, early retirement is not solely a problem on a national level, but it is also increasingly affecting organisations directly.

At first sight, the pension and social security system may seem irrelevant in relation to IC, but as the discussion above shows, they are actually highly significant. The study by Haines and Bédard (2001) discusses the relevance of early retirement in relation to an organisation’s functioning, but seeing its effects on recruitment possibilities reveal even
more serious challenges. Breaks in knowledge sharing networks are repaired over time, but a shortage of employees requires more active manoeuvres from the organisation.

External structures in the IC theory are seen as being important as the source of extra-organisational input into the knowledge processes of the company. This point of view provides a perspective on identifying new actors besides occupational health care service providers that are relevant in meeting the requirements of the knowledge intensive work and supporting employees’ wellbeing. On the other hand, there was no discussion in the data about organisational boundaries losing their significance. This emphasised role of inter-organisational networking may also weaken the chances of MWA because the employment relationship can become less clear. Collaboration emerges through contracts between partners. This process requires negotiation and compromises can even risk wellbeing. Development activities always generate risks but altering employer relationships reduces an organisations’ willingness to take them. Labour market organisations have played an important role in ensuring employees’ position, but this changes if entrepreneurship increases along with the network economy.

6 Conclusions

Based on the study data, it would seem that MWA has two different approaches and this division also has economic implications. The human capital point of view examines the approach of supporting an individual’s resources. In economic terms this approach is oriented to the prevention of costs at both the business and national economic level. In business organisations the prevention of costs is related to sick leave and production losses. Early retirement puts considerable cost pressure on the public sector because the social security system has to cover pensions and at the same time the production input of an individual is lost. However, disability pensions are also costly to organisations because of the Finnish compensation system. For small companies there is no excess share but this increases along with company size, and finally, large companies with over eight hundred employees must cover all the costs of a disability pension. In general, the approach of supporting an individual’s resources, that is, the human capital point of view, represents the traditional approach of MWA and accordingly the findings about economic characteristics are in line with, for example, the work by Oxenburgh (1996).

The current character of work life emphasising the anticipation of changes in the business environment puts increasing demands on collaboration and the functioning of a work community. This was apparent through the internal structures point of view. Instead of merely organising different projects to improve a variety of resources, work-related wellbeing stands out as a constant process manifested in the daily functioning of an organisation. However, there was scarcely any discussion about the economic characteristics of this approach in the data. This might be partly due to the lack of a framework suitable for analysing them. The IC theory characteristically emphasises competence as a collective capability instead of merely an individual’s characteristic (Hussi 2004a). The work community-based internal structures point of view scrutinises the development activities supporting this shift of emphasis.
Observing these two different approaches makes one wonder whether these can be related to each other? One possible approach to overcome this dichotomy is a job demand-control stress model (see, for example, Karasek and Theorell 1996). According to this model it is the combination of high job demands and low control over work tasks that results in stressful work. Job demands can be seen as the variety of different resources that a successful undertaking of work requires, and thus it represents the individual level of MWA. Job control constitutes the features of a work community, like opportunities to participate in and have an influence on the design of work tasks and support from the work community. This combination of challenges and competencies, which are related to control, is also relevant from the IC point of view, as the flow model is built around these two dimensions (see, for example, Csikszentmihalyi 1997, 2003). The combination of high challenges and high competencies results in the state of flow, in which motivation and creativeness are on the highest level. Observing this resemblance between these two models the theoretical frameworks suggest the modification of the MWA framework.

The prevailing perspective of MWA emphasises alleviating work-related negative effects especially on health. This is because the whole MWA framework is argued in the data to be initially established as an approach to reduce the increase of costs caused by work-related disability on the level of the national economy. Improvements in terms of employees’ competencies, functioning of the work community and a safe work environment have tended to support health. These areas of priority are described in Figure 1.

![Figure 1 The areas of priority in the prevailing MWA framework](image)

The IC framework, on the other hand, focuses on strengthening creativeness. Creativeness is aimed at creating use value that the customers are willing to pay for. The central element of creativeness is competence. As it was already discussed in the section on human capital, the importance of employees’ competence is increasing in terms of MWA, as well. However, it is important to note that it is not the single individual’s competence that makes the difference in knowledge creation, but competence is more a collective phenomenon by its nature and thus work community is another central element. Supporting employees’ health improves opportunities to participate in the functioning of the work community. On the other hand, work environment can be
designed to support interaction and creativeness. Figure 2 provides a visualisation for developing the current MWA framework to meet the requirements of the knowledge-intensive work. The outline is in line with Hussi (2004a), but this also shows the importance of use value and the customer as the goal of knowledge creation.

![Diagram](image)

**Figure 2 The areas of priority in the MWA framework for knowledge-intensive work**

Although this study gives an insight into MWA from an IC point of view, its actual effect on an organisation’s performance and thus economic effects are still unclear. Actually, the improvements in an organisation’s financial results are even somewhat surprising, as the examination above shows that MWA is targeted at quite different outcomes. Improved organisational performance as the side product of MWA was discussed in the data but this connection needs to be further elaborated. As it has been stated above, this study shows that human capital and internal structures are central points of view in outlining actual activities undertaken as MWA. Human capital is by definition an individual’s characteristic and internal structures are accordingly related to an organisation.

Comparison of the IC theory and findings from the analysis of the MWA experts’ interview data presented in this study reveals considerable similarities between these frameworks. Even though the intellectual capital and maintenance of work ability frameworks have different areas of emphasis in their axioms, the examination above suggests modifications to overcome these differences. This study has taken us further in the examination of this relationship than the earlier work by Hussi (2004a) but more work is still needed to solve the mechanism through which the maintenance of work ability could be beneficial for a company’s efforts to develop its intellectual capital.
References


QUESTIONS ON MAINTENANCE OF WORK ABILITY

1. How would you define work ability?
   • How would you describe a situation where much attention has been paid to work ability, but it seems that the problems just increase?
   • Why do we have a work ability concept in Finland (as opposed to practically all the rest of the world)?

2. What factors influence work ability?

3. How can work ability be improved?

4. Can work ability be measured by one instrument?
   • By what / why not?

5. What is the best indicator of work ability?

6. What is the relationship between a company’s financial performance and work ability?

7. Is work ability related to the company’s financial performance in the short run or the long run?

8. Can there be situations where financial performance is improved but work ability is weakened?
   • What are these situations like?

9. Are you familiar with the Balanced Scorecard?
   • Does BSC describe work ability?
   • In what sense (example)?

10. Are you familiar with Human Resources Reporting models?
    • Do Human Resources Reporting models describe work ability?
    • In what sense (example)?

11. What is the relationship between work ability and an individual’s health like?
THE MANAGERIAL RELEVANCE OF MAINTENANCE OF WORK ABILITY – A FINNISH PERSPECTIVE

Tomi Hussi

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Abstract:

Finland has pursued a law-based work ability policy for more than a decade. Many studies indicate that it has been very successful from a health point of view. It has also been demonstrated that it is economically feasible both on a micro and a macro level. In the present study, a number of experts in the field were interviewed about the content of the Finnish maintenance of work ability policy. The interview data was analysed from an organisational performance point of view. The analysis indicates that the Finnish maintenance of work ability policy works because it includes relevant management and leadership elements. It is not only a health programme, but is also based on measures that are conducive to economic growth.

Key words:

individual’s resources, improving work community’s functioning, organisational performance, management, leadership
1 Introduction

Maintenance of work ability (MWA) has been a central framework for occupational health and safety activities in Finland since the early 1990s. Health is not the only factor influencing the work ability, but competence, work community and work environment are also included in the framework. The maintenance of work ability includes activities that aim at improving the physical and mental condition, adopting healthier ways of life, developing professional skills and adaptation to changes, and supporting job satisfaction and motivation by feedback and reward systems. (Aro, 1998.) Collaboration between members of the work community, as well as different work organisations, is strongly emphasised. An individual is an active doer and participator instead of a mere object in this framework. This means adopting new work roles and the courage to build new ways of collaboration. (Rissa, 1996.)

The starting point for the Finnish maintenance of work ability approach can be traced to a memorandum on maintenance of work ability at workplaces created by social partners in 1989. This resolution was written into the law on occupational health in 1991. The new compensation system for occupational health services in 1995 included maintenance of work ability in coverable activities. (Bergström et al., 1997.) According to Finnish authorities, maintenance of work ability programmes include all such work-related actions that the employer, employees and collaborating organisations perform in co-operation, in order to improve and support the work ability and functional capability of every individual taking part in working life in every phase of their work careers. (Ministry of Labour, 1996; Ministry of Social Affairs and Health, 1992.)

Extensive MWA barometer studies have been undertaken to observe the effects of these activities in Finnish work life. Among other findings, this research has shown that companies perceive MWA activities to have considerable financial benefits. (Peltomäki et al., 2002; 1999.) However, the analysis of the mechanics behind this conception has been rather limited. It has often been suggested that maintenance of work ability improves the service capabilities of an organisation and thus results in better financial performance (Ilmarinen, 1999; Aro, 1998; Rouhesmaa et al., 1998; Matikainen, 1995). However, the argument of improved quality of internal and external services still leaves this connection rather obscured.

Essay number four of this thesis analyses the same interview data on maintenance of work ability experts that is used in this study by having intellectual capital as the frame of reference. This study showed among other things that an individual and a work community’s levels are identifiable in relation to MWA. Similar thinking has been presented by many other authors, as well (see, for example, Jurvansuu et al., 2000; Peltomäki et al., 2002; Mäkitalo, 1999; Peltomäki et al., 1999; Mäkitalo – Launis, 1998) but this distinction is strongly characterised by an either/or standpoint. Otala and Ahonen (2003) emphasise that these approaches are inter-linked and support each other. Accordingly, in this study the analysis has been conducted from both these perspectives.
2 Research design

The research question of this paper is how does maintenance of work ability improve organisational performance?

This question is approached by an analysis of interview data that consists of eleven experts in the field of maintenance of work ability. The selection criteria for these experts were the high-level of expertise and as broad a coverage of different perspectives as possible. The distribution of interviewees according to their occupational backgrounds is presented in Table I. Interviews were conducted in April - May 2000. In the results section, I have labelled the interview references following the classification of the table below.

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<tr>
<th>Background</th>
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<td>Labour market organisation</td>
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Table I Background of the interviewed maintenance of work ability experts

The interviews were performed following a predefined question structure, which can be found in Appendix A. The leading idea in generating the interview structure was to form questions so that they would be in line with general IC theory in the beginning and gradually take up more unorthodox perspectives. Simultaneous collection of analogous interview data among intellectual capital experts also influenced the selection of the questions.

The results of the data analysis are presented in the following section.

3 Results of the analysis

This section presents the results of analysing the interview data from the individual and work community point of view. Findings for both perspectives are summarised after a detailed scrutiny of the results.
3.1 Individual level MWA activities

The analysis of the interview data from an individual level point of view shows that maintenance of work ability can be seen as an antithesis of disability. Furthermore, it is acknowledged in the data that social partners had a strong role in establishing the role of MWA approach as the dominant framework for occupational health and safety activities in Finland. These historical roots, that relate MWA to the social security system and early rehabilitation, are seen to have notable implications on the Finnish work ability concept because individuals’ resources and especially health are strongly emphasised. The criteria for disability to work are medical-social by nature. Many interviewed experts see health as a fundamental prerequisite for capability. It is seen to form a foundation on which other elements of work ability are built. Thus, any reduction in health is seen to have a direct effect on work ability. According to the interviews, the most widely used tool for evaluating work ability has been the work ability index. It has a strong emphasis on health resources because of the social security legislation.

Health has direct implications on work ability. If an individual’s health situation worsens, either mental or physical health, one cannot perform as before. Or being tired makes it impossible to reach the same results and thus the work ability is diminished, as well.

Research Institute

The interviewed experts say that the economic consequences of MWA are most easily seen in relation to health. Longitudinal research has shown that good work ability results in better productivity and quality of work, as well as an individual’s better quality of life and wellbeing. Absences through sickness create considerable costs for organisations and there have been many kinds of activities aiming to lower them. Disability pensions are also expensive, especially for larger companies, due to the Finnish compensation system.

If employees are in extremely poor shape they absolutely cannot perform their tasks even in the short-term because of absenteeism and other kinds of productivity losses.

Insurance company

The interviewed experts argue that introducing physical exercise in work places was the easiest starting point because the need was easily understood and results are so observable. Improving mental and social capacities is seen as a more difficult task. However, having physical exercise as the starting point for maintenance of work ability is not generally seen as a good thing.

It is easy to say that if you jog three times a week, it will improve your physical capacity. But you cannot say that if you visit someone three times a week, it would improve your social capacity. It is something quite different.

Research Institute

I do think that having physical exercise as the starting point is undoubtedly a burden, it has to be admitted here. It increases social competencies but has no influence on competence. We know that it hardly increases readiness to make improvements in relation to ergonomics.

Research Institute
Private life also has many features that can affect work ability through health. Reduced work ability is not always caused by work but it may be due to events beyond the work context. There must be a balance between work and private life that makes it possible to relax. Otherwise it is not possible to maintain work ability in the long-term. The essence of guiding employees’ ways of life is that the individual has the final responsibility. However, exaggerations have been seen, as well.

(...) guarding company plans to set the waist measurements as one of the recruitment criteria. This leads us to consider how much work related responsibility can be extended, this turns into a normative issue (...). Then we must think what is work ability. Doing such things in the name of MWA makes it somehow acceptable. There are some unsound features that are getting introduced into this discussion.

Consultant

The interviewed experts claim that competence and the training perspective is the most recent insertion into the MWA framework. Strengthening the employees’ competencies, which are essential for working, improves the mastery of work tasks and thus work ability. As business life is getting increasingly knowledge intensive, the competence issues become more and more important. Competence includes professional skills, communication abilities, information technology skills and language skills.

... if you are incompetent in your tasks, the results are a bit different than those of a competent person. And if we think about the reasons behind the employment, it is to get the work done. If you are incompetent, your work ability is not in order, regardless of how many press-ups you can do.

Consultant

The data of the study also strongly brings forth the idea that occupational safety issues form the grounds for work ability because exposure to physical, chemical and biological risk factors, as well as insufficient safety systems, can create occupational accidents or disease causing disabilities. In Finland, considerable attention has been paid to occupational safety issues and generally work environment risks are well managed. Statistics show that occupational diseases and mortality caused by work environment factors are currently not a major problem but work environment experts still have many challenges to tackle.

... Work environment is in a way built and managed by somebody else but it is still an artefact. If it is well designed so that occupational safety is at a good level, accidents are less probable. If ergonomics and everything is in order, it helps to preserve work ability better than if these issues were neglected.

Insurance company

In the interview data, the individual level view stresses that an individual’s resources are to be seen in relation to the work requirements. These resources consist of physical, mental and social resources. The work requirements include both mental and physical elements, such as work community, leadership, working hours, work environment, physical load, ergonomics and work hygiene. The individual’s resources have inherent dynamics, as certain resources strengthen over time whereas others decrease. At the same time, changes also take place in work requirements. If the development in these
two elements goes in opposite directions, it appears as a contradiction that results in decreased work ability.

Very many people get confused here, because they take one module and start calling that work ability. In reality that is not work ability but an element of an individual’s resources. If it is not related to work, you cannot talk about work ability. (...) In Germany they talk about physical capacity and they see that as work ability. It does not say anything about your work ability if you can perform well on an ergometer but it has to be related to the requirements of your work. (...) Everybody is talking about this life-long-learning, that it is the same as work ability. It is not work ability but the competence module of an individual’s resources.

Research Institute

On the other hand, an individual level approach is also criticised by some of the interviewees because it is seen to emphasise developing employees’ resources to better meet the work requirements and ignore the possibilities of developing the work context. To some degree a tendency can be seen among the proponents of this approach that developing the work requirements is the last resort if other alternatives have proved ineffective.

What needs to be done from the work community and work environment point of view, these are in a way embedded there [in the organisational development (T.H.)] so that they are not systematically developed [in MWA context (T.H.)]. Here in the work community aspect there can be, for example, projects that cover also values and attitudes. (...) There are a lot of illnesses that do not prevent working if suitable operations have been undertaken here in the work requirements. Sickness does not exclude a person from the working life, but it requires this dimension [of work requirements (T.H.)] to be considered.

Research Institute

In general, the analysis of the interview data shows that the individual level point of view stresses an individual’s resources in relation to the work requirements. Health, in particular, is strongly emphasised because it is seen as a foundation on which other elements of work ability are built. Absences through sickness and disability pensions also create considerable costs for organisations.

It is argued that introducing physical exercise in work places was the easiest starting point for MWA. However, there is no general agreement about the validity of this approach as the primary target of influence. Strengthening the employees’ competencies, which are essential for working, improves the mastery of work tasks and thus work ability. Occupational safety issues are crucial for work ability because exposure to physical, chemical and biological risk factors, as well as insufficient safety systems, can create occupational accidents or disease causing disabilities.

On the other hand, the individual level approach is also criticised because it is seen to emphasise developing employees’ resources to better meet the work requirements and ignore the possibilities of developing the work context. Therefore, it is timely to scrutinise the data also from the work community point of view.
3.2 Work community level MWA activities

When analysing the data from a work community perspective, the interviewed MWA experts argue that innovativeness and the ability to develop new products, services and processes are the key elements for organisations to survive in the highly intensive competition of modern business life. Innovativeness requires working in groups because collaboration is the basis for creating new ideas. At the same time, the increasing shortsightedness of business life is seen to lead to emphasising economical performance over the sustainable use and development of organisational resources. It is argued in the data that this contradiction between requirements and realities of current work life results in considerable challenges. Work life is claimed to be directed by outdated norms whereas the daily activities are run on the new terms. Mechanical effectiveness is appreciated, even though creativity is the new prerequisite.

Employees work beyond their efficacy and show up in the workplace even though they are ill, for example. They work too long days, pay no attention to fitness or competencies. Current know-how might be quite sufficient in the project at hand but as development in that field moves rapidly and there is no chance to learn, it may turn out that after the project the person is exhausted and competencies are outdated.

Labour market organisation

The interviewed experts stress the work community’s role in initialising development planning processes as the core of the maintenance of work ability approach. It is the work community that creates the goals, job descriptions, the combination of tools, ergonomics, mutual interaction, strategies etc. so that they either improve or disintegrate work ability. A significant amount of the mental work requirements is actually generated at the work community level because attempts to continue working just as before despite the changes in methods and targets make it very difficult to work fluently and strain the employees. Employees experience a considerable burden because of information overflow and fragmented tasks. The lack of control over work causes stress and also directly influences the economic performance of an organisation. The most essential initiative is that a work community as an organisational system decides to aim at maintaining the work ability of its members.

Interest groups on both the side of the employee and employer agree that this truly is a process and not a project. This is what we actually do from now on and it motivates us so that each time the business plans for the next year are made, there is one topic entitled “Maintenance of Work Ability in Our Organisation”. In this planning process we look last year’s situation and also ahead. (...) It doesn’t mean extensive recruitments or increase in salary costs but it is more a new way of thinking that takes into account people’s wellbeing, development etc. It actually is a strategic way of thinking instead of a huge investment.

Labour market organisation

It is argued in the data that the work communities collectively innovate new ways of working. This process includes both identifying bottlenecks in the fluency of work and the planning of activities to overcome these problems. Identifying the bottlenecks is a context-bound process. It requires observing the daily functioning of the work community in order to conceptualise the situations that constitute a harmful burden on employees. The problems can be characteristic of a certain industry or even specific
work community. According to the interviewed experts, this development requires leadership practices that emphasise empowerment. Empowerment is built by letting the individuals influence the goals, and analyse their work ability in relation to improvements that they find most essential for supporting their wellbeing.

I would take subjectivity and sort of empowerment ideas as a starting point. What things should be improved in order to increase employees’ wellbeing? Instead of problem-orientation I see this work ability concept in solution-focused way. (...) I prefer to ask under what circumstances communication, for example, would function extremely well?

Research institute

According to the interviewees of the data, successful empowerment brings out the positive energy residing in a work community that could not be put to use by a coercive management approach. The ability to control the mental load, for example, requires autonomy in relation to work tasks. It is up to both manager and individual’s skills to, for example, make the work days a reasonable length. Increasing empowerment within a work community is difficult because it places considerable demands on both supervisors and employees as the responsibility over development spreads more widely over the organisation. However, it is essential to ensure that goals set on different organisational levels are in accordance with the general objectives of the whole organisation. There is a need for general agreement about what is essential for the organisation. In such a setting an expert can be used to facilitate the emergence of applicable plans instead of the source of transcendent authority that stipulates the targets. Systematically organised development discussions and department meetings are important arenas for generating a shared view of the goals. A balanced scorecard can be seen as an example of a tool for outlining the work and its goal-oriented planning.

I find leadership is very important because it is possible to steer employees in a motivating way by skilful leadership whereas poor leadership destroys the motivation and thus has very negative effects.

Research institute

It is stated in the data that implementing a new leadership paradigm to an organisation can be difficult because of resistance towards changes. Emphasis of empowerment breaks down the traditional power structures and old organisational culture can strongly contradict such development.

A change in the leadership paradigm is a cultural matter that takes place very slowly. I, for example, belong to a generation that considered enjoying work stupid. Enjoyment did not belong to the work context, working is only about getting the tasks done. This was certainly a dominant mindset even some twenty-thirty years ago.

Insurance company

The data shows that collective development of work requires a well-functioning work community in which information flows efficiently; everyone knows the expectations and gets social support from the boss and the colleagues. The significance of different informal networks is essential in modern work life. One has to be familiar with different formal and informal networks in order to easily organise issues in an organisation. Such social competence notably affects more challenging tasks, in particular. Introducing a
new employee to the work community seldom covers such connections and this puts a considerable mental load on the newcomer. Knowing the expectations means being familiar with the goals of the task. Social support by the work community includes positive feedback, encouragement and trust. The lack of social support results in crumbling motivation and lost innovativeness.

No matter how enthusiastically I arrived at work, the icy spirit would make a big difference. No one greets me when I walk through the door or even complains about laziness because I’m not arriving before nine o’clock etc. This certainly would kill my drive to work.

The interviewed experts argue that development activities also cause a mental load, but it is not harmful as is the case with uncontrolled change. The difference is that development activities aim at some kind of solution. Harmful strain is characterised by a lack of vision to find solutions and a sense of a dead end. The load caused by development activities has a temporary nature and is seen as a necessary phase that has to be undertaken in order to overcome the observed problems of work. It would be a delusion to aim at excluding all burdens from work life. Business requires development phases to meet the changes in the competitive environment but it is essential that initiatives are undertaken to meet the challenges instead of trying to continue with obsolete practices. People have a surprising ability to adapt demanding situations but breakdown is devastating when the limits of endurance are surpassed. The increasing use of temporary work and the pressures of downsizing create uncertainty among employees. The required work contribution in terms of performing the basic tasks becomes more demanding and prerequisites for skills development and organisational regeneration diminish. Challenging customers force organisations to develop themselves and thus also support work ability.

There are situations, in which employees experience considerable strain that is clearly negative by nature. It is characterised by lack of prospects and a feeling of a dead-end. Then there is also another kind of strain [that relates to organisational development activities (T. H.)] that you could expect to result in equally high stress or symptoms, but there are some chance of solving the situation. And we should somehow be able to make a distinction between these two.

The central role of different events, as sports days and other social gatherings, organised by the employer was also discussed to a considerable degree in the data. They are seen to create one arena that enables informal networks to be formed. These events have become very common manifestations of MWA in Finland. Improvement of group work skills can also include group discussions, development of interactions skills, problem-solving techniques etc. However, the common feature of these events is that they have no direct connection to actual work tasks and its problems that are observed by the employees. If an event is successful, positive results can be achieved for a limited time as social relations are improved in the work community but because of the few long-term effects they have turned out to have a rather weak influence on work ability.

Sometimes I get the impression that the whole work ability is these adventure and exercise experiences. It refers to what I already said earlier that the concept is a bit misunderstood or it is
difficult to grasp work ability. Yet this feature is getting more and more popular and different kinds of new service providers organising different experiential events enter these markets.

Insurance company

It seems that these events have a well-established position in this setting - that companies have to undertake them.

Consultant

The analysis of the data from a work community point of view shows that organisational innovativeness is a prerequisite for surmounting the highly intensive competition of the current business environment. Innovativeness requires collaboration. On the other hand, the strict competition also increases the short sightedness of business life. This contradiction between requirements and realities of current work life results in considerable challenges. Work life is claimed to be directed by outdated norms whereas the daily activities are run on the new terms. Mechanical effectiveness is appreciated, even though creativity is the new prerequisite. Attempts to continue working just as before despite the changes in methods and targets creates considerable difficulties in the work fluency and strains the employees. A significant amount of the mental work requirements is actually generated on the work community level. Employees experience a considerable burden because of information overflow and fragmented tasks. The lack of control over work causes stress and also directly influences the economic performance of an organisation.

The interviewed experts stress the work community’s role in initialising development processes. Work communities collectively innovate new ways of working but this development requires empowerment. Development activities also cause a mental load, but it is not as harmful as is the case with uncontrolled change. Business requires development phases to meet the changes in the competitive environment but it is essential that initiatives are undertaken to meet the challenges instead of trying to continue with obsolete practices. Challenging customers force organisations to develop themselves and thus also support work ability.

4 Conclusions

There is a notable parallel between the results presented above and the management-leadership distinction that is common in business administration studies. MWA targeted at individuals has management characteristics whereas the work community level is related to leadership. Therefore, this study suggests that the improvement of organisational performance resulting from MWA occurs in improved management and leadership practices that are conducive to the improved wellbeing of the organisation’s employees.

Management typically emphasises stability, order and efficiency in evaluating how things get done and trying to get people to perform better. (Yukl, 2002) Management is often seen as authority relationships between managers and subordinates that aims at meeting given goals by the appropriate use of resources available (Rollinson – Broadfield, 2002; Rost 1991). Predictability is achieved by setting operational goals,
organising and staffing sufficient resources for these purposes, monitoring results and solving conceivable problems. (Kotter, 1990a.)

From the individual perspective, the attempts to improve individuals’ resources aim at organising and staffing sufficient resources to meet the requirements of an operational task. This view reflects the goal of solving conceivable problems to improve the current functional capability of an organisation. Health improvement orientation indicates the aim of getting an organisation to perform better. This is especially evident in terms of economic consequences that reflect the goal of improving organisational capabilities to maintain productivity. Competence can be seen as a resource that an employee either does or does not have. It is the basic resource that defines whether an employee is a useful resource for an organisation in the first place. Accordingly, removing the physical-chemical risks of the work environment indicates the aim of using the available resources appropriately. Overcoming competence gaps and improving occupational safety are clearly managerial efforts that aim at solving a conceivable problem.

On the whole, the approach of seeing work ability as an individual’s resources in relation to the requirements of the work is expert-inspired and an employee is largely seen as an object of different activities that are determined by the scientific framework. Seeing MWA as supporting the individual’s resources to keep up with the work tasks turns work ability into a given, rather clear-cut entity that can be operationalised by measuring absences due to sickness, competence gaps, accident frequencies etc. Reluctance towards changes in the context of work reflects the importance of stability. If deficiencies are observed in relation to these resources, adequate solutions to overcome problems are defined through an authority relationship.

Leadership can be seen to emphasise organisational change by developing a vision of the future and a strategy for making the necessary changes. Communicating and explaining the vision is also an important feature along with motivating and inspiring people to attain it. (Kotter, 1990a.) Leadership emphasises flexibility, innovation and adaptation in assessing what things mean to people and creating agreement about the most important things to be done (Yukl, 2002). It is a multidirectional influence relationship in which both leader and followers get some of their needs satisfied. This relationship is conferred from below because non-coercive interaction takes place to decide prospective changes. The relationship is potentially a fragile state of affairs as the needs of both the leader and the followers can change. (Rollinson – Broadfield, 2002; Rost, 1991.)

The data analysis on the work community level shows that the increasing demand for creativeness in business life emphasises the collaborative capabilities of an organisation. This goal of work community level MWA is at the core of leadership. The pressure conflict in modern work life extracted from the interview data demonstrates that there is a need for different approaches to steering organisations than the traditional management approach alone. Rapid changes in the operational environment outdate the emphasis of stability, predictability and order. The organisation’s flexible ability to adapt and innovate becomes increasingly important. Empowerment brings forth the non-coercive nature of work community level MWA. The work community’s role in undertaking development activities explores flexibility and organisational adaptation.
Being familiar with the goals of the task and more broadly the whole organisation requires communicating and explaining the vision. Emphasis on a well functioning work community is directly related to the multidirectional nature of leadership.

The discussion about leadership in the data is very well in line with the definitions presented above. The goals of creating the vision and strategy in mutual understanding and non-coercive nature emphasised by empowerment bring home the importance of leadership in the work community perspective. The ability of relating goals on different organisational levels to each other depend on well-functioning communication that emerges in effective work communities.

The simultaneous need for both leadership and management in securing the success of an organisation is crystallised by their complementary nature. Strong leadership can disrupt the order and efficiency of an organisation whereas strong management can discourage risk taking and innovation. (Kotter, 1990a; 1990b.) Accordingly, neither individual nor work community level MWA is sufficient as such, but they have their own roles in the organisational context. Work community level MWA focuses on identifying problems and finding solutions to them, whereas individual level MWA includes the concrete undertaking of activities that are considered suitable solutions for securing the organisation’s capacity. The combination of the two approaches is in line with Kotter’s (1990b) statement that management-leadership is not an either/or dichotomy but both perspectives are needed because they have specific roles in an organisation’s functioning. In relation to MWA, this distinction makes it visible how both individual and work community level approaches are needed for the balanced development of work ability. Individual level activities help to support employees’ resources whereas the work community level develops the context in which these resources are being used. Focusing on either one of these without the other results in biased activities that cannot be expected to provide optimal results in the long run.

There is an interesting change of perspective that is taking place in relation to the work environment. As the data of this study, for example, shows, the discussion about work environment has focused on increasing safety. However, an emerging trend is the aim of developing work environments that would support the creativity of work communities (see for example Hussi, 2004; Edvinsson 2002). Increasing the knowledge intensiveness of production forces us to think about work environments in a whole new way. They should be seen as arenas for collaboration resulting in innovative ideas. There are some attempts to approach this perspective but there is room for a lot more work in this field, which is why this area is one of the most essential areas for future research.
References


QUESTIONS ON MAINTENANCE OF WORK ABILITY

1. How would you define work ability?
   • How would you describe a situation where much attention has been paid to work ability, but it seems that the problems just increase?
   • Why do we have a work ability concept in Finland (as opposed to practically all the rest of the world)?
2. What factors influence work ability?
3. How can work ability be improved?
4. Can work ability be measured by one instrument?
   • By what / why not?
5. What is the best indicator of work ability?
6. What is the relationship between a company’s financial performance and work ability?
7. Is work ability related to the company’s financial performance in the short run or the long run?
8. Can there be situations where financial performance is improved but work ability is weakened?
   • What are these situations like?
9. Are you familiar with the Balanced Scorecard?
   • Does BSC describe work ability?
   • In what sense (example)?
10. Are you familiar with Human Resources Reporting models?
    • Do Human Resources Reporting models describe work ability?
    • In what sense (example)?
11. What is the relationship between work ability and an individual’s health like?