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INTELLECTUAL CAPITAL AND MAINTENANCE OF WORK ABILITY – the Wellbeing Perspective

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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 are involved in the shift of emphasis from individual to collective competence.

Key words: intellectual capital, knowledge creation, maintenance of work ability, employees' wellbeing, sustainable economic development

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TIIVISTELMÄ: Tämä tutkimus osoittaa, että tutkimushaastatteluissa asiantuntijoiden käyttämissä määritelmissä osaamispääomasta on hyvin paljon yhteistä työkykyä ylläpitävän (TYKY) toiminnan käsitteiden kanssa. TYKY-toiminta on Suomessa keskeinen työturvallisuuden ja -terveydenhuollon viitekehys. Kompetenssi liittyy kumpaankin käsitteistöön, mutta painotuksissa on jonkin verran eroa. Osaamispääoman asiantuntijoiden näkemys kompetenssista painottaa yhteisöllistä ulottuvuutta enemmän kuin TYKY-viitekehys. Osaamispääoman kannalta myös tuottavuuteen liittyvät näkökulmat ovat keskeisempiä, kun TYKYn tärkein tavoite puolestaan on turvallisuuden ja työhyvinvoinnin turvaaminen. Suurin ero liittyy siihen, miten terveyden merkitys nähdään näissä käsitteistöissä. TYKYn perusoletuksena on, että terveys on erittäin tärkeä osa-alue tuottavuuden kannalta, kun taas osa haastatelluista osaamispääoman asiantuntijoista sivuuttaa tämän teeman kokonaan. Tutkimuksen pohjalta on helppo havaita, että osaamispääoman asiantuntijoilla on paljon opittavaa psyko-sosiaalisen terveyden vaikutuksista innovatiivisuuteen ja yksilöiden tuottavuuteen. Etenkin työhyvinvoinnin osa-alueiden merkitys osaamisen painopisteen siirtymisessä yksilötasolta yhteisöjen ominaisuudeksi tulee uudenlaisella tavalla näkyväksi.

Avainsanat: osaamispääoma, tiedon luominen, työkykyä ylläpitävä toiminta, työntekijöiden hyvinvointi, kestävä tuloskehitys

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 – Takeuchi 1995), knowledge creation has a central position in this setting as the source of organisational innovativeness. Knowledge creation is completely dependent on the human capital of an organisation. Employees' health, and more broadly wellbeing, can be seen as a central prerequisite for successful knowledge creation. 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 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 design of this study and the maintenance of the work ability framework on a general level. In section three, the four dimensions of maintenance of work ability are presented in greater detail, as well as the results of the analysis for each of these and conclusions at this level. Finally, section four draws conclusions concerning the whole paper by showing the importance of wellbeing in relation to intellectual capital.

2 Research design and methodology

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 creation?

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.

Background	
Research institutes and universities 2 professors in accounting 2 professors in business studies 1 director of IC research institute	5
Chief knowledge officer	1
Consultant - 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.	4
Total	10

Table I Backgrounds of the intellectual capital experts interviewed

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 adopt more unorthodox perspectives. The simultaneous collection of analogous interview data among MWA experts also influenced the selection of the questions.

There follows a general description of the maintenance of work ability approach that was the framework of analysis used in this study.

2.1 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 limitlessly 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.)

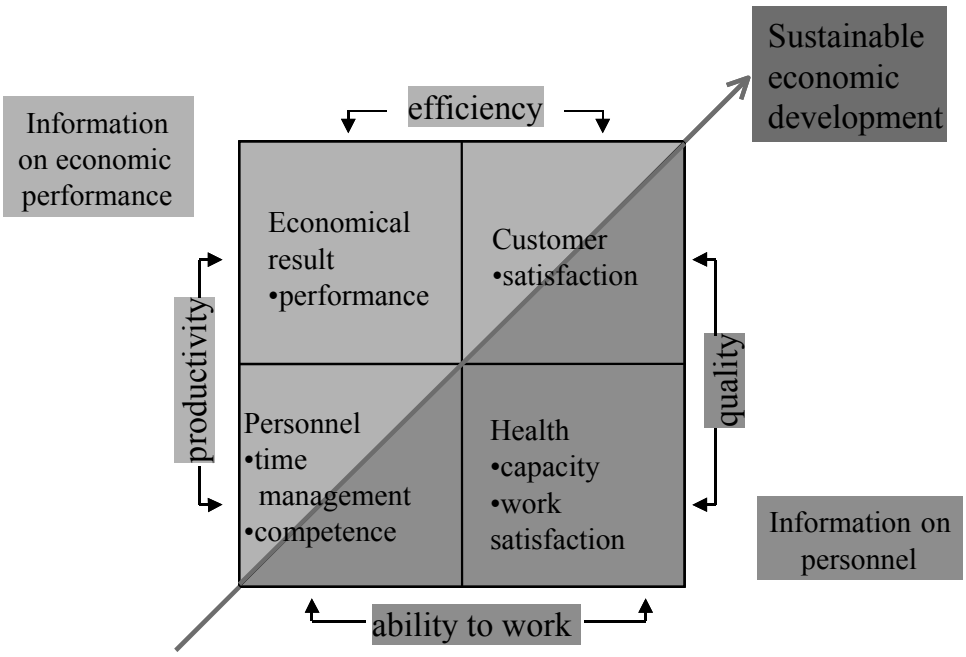
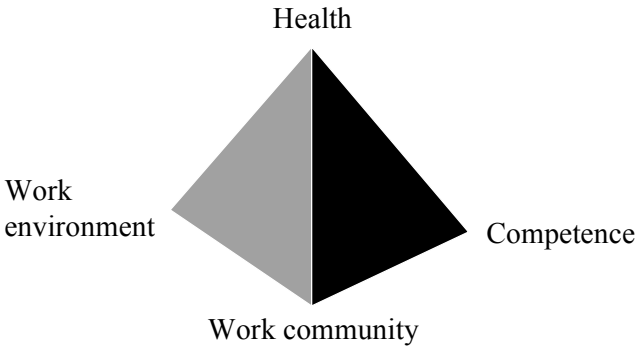


Figure 1 Sustainable economic development[1]

[1] This figure is adapted from Liukkonen's (1998) model on Dual-evaluation.

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 participator instead of a mere object in this framework. Everyone has to 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 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.)



Source: Huuskonen *et al.* 1997

Figure 2 Factors influencing an individual's work ability

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 work places created by social partners in

1989. This resolution was written into the law on occupational health in1991. 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 these challenges as we move to the empirical part of this essay.

3 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. At the beginning of every section, I will briefly describe the significance of the focal maintenance of work ability element. 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. In conclusion, the empirical findings will be discussed in relation to the MWA approach.

3.1 Competence

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 practises. (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. (Huuhtanen 1999.) Empirical results show that the improvement of professional competencies is an important orientation because it helps create a healthy organisation with natural collaboration. (Jurvansuu *et. al*. 2000b.)

3.1.1 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.
>
> Academic

> 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.
>
> Business life actor

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.
>
> Academic

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.
>
> Business life actor

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 under-

standing 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.
>
> Business life actor

3.1.2 Meeting the changes of the business environment is the driving force for competence development towards a collective characteristic

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.

3.2 Work environment

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).

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.)

3.2.1 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

3.2.2 Ergonomics is a central development area of work environment in knowledge work

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.

3.3 Work community

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.)

3.3.1 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 Ericssons'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

3.3.2 The organisation's renewal capability and the need for a new leadership paradigm are central challenges in the development of the work community

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.

3.4 Health

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' well-being 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.)

3.4.1 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.
>
> Business life actor

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.
>
> Business life actor

3.4.2 Healthy employees constitute the creative organisation

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.

4 Conclusions

Table II presents the reconstruction of the findings in the results section above.

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.

	Maintenance of work ability			
	Competence	**Work environment**	**Work community**	**Health**
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.	• The role of information and communication technology is to enable and support knowledge sharing by opening access to relevant information. • Information networks also enable new kinds of inter-organisational collaboration. • Designing work environment so that it is ideal for knowledge creation supports creativeness.	• Increasing the number of people participating in the planning processes improves organisation's strategic abilities and makes it possible to decentralise decision-making. • Leadership has to shift from supervision towards stimulating relationships. Open communication culture is also important. • Ability to exploit radical innovations requires readiness to change.	• Health, which includes mental, emotional and social dimensions, is a prerequisite for ability to take autonomous responsibility for work. • 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.
Insights of MWA that are beyond current IC framework but are potentially relevant for knowledge creation	• 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.	• 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.	• Ageing impairs physical and perception capabilities. These changes in an individual's abilities should be taken into account when designing work tasks. • Physical exercise increases physical but also mental resources of an individual. • Well-planned MWA reduces sickness absences and early retirement. • Uncontrolled work-related stress can lead to burnout.

Table II Reconstruction of the current IC concept and its limitations in the light of the MWA framework.

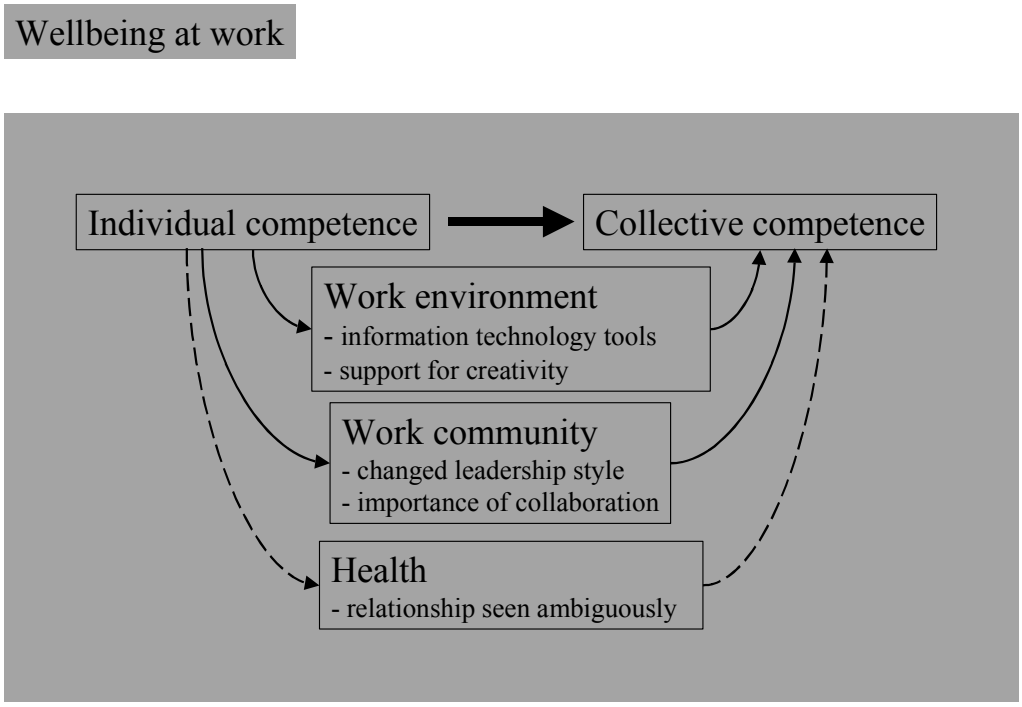


Figure 3 Logics of turning individual competence into collective competence

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.

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Appendix A

The question structure for the interviews

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?

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