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The Tacit Signal Method in Human Competence based Organization Performance Development

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Abstract

Kesti Marko
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The dissertation deals with organization performance improvement using tacit signal development process. Tacit signals are human-based guiding opinions that rise from situation based tacit knowledge related to organization human competencies. Tacit signals are utilized as organization development inquiries in connection to the development process for implementing optimal improvement actions in the workplace level. Optimal workplace innovations are collectively agreed to be the development actions with the best value for improving the working society competencies and performance.

The aim of the dissertation is to study effective organization development process based on tacit signal method that utilizes the employee tacit knowledge. In this study the human resource based organization performance development phenomenon is studied within the work society and the organizational level. The dissertation has two main targets: firstly, to study the effectiveness of the tacit signal development process in organization performance improvement and secondly, to increase management and scientific knowledge of the way in which human resource development affects organization performance scorecards. The research tries to find out causal-explanation why effective organization development can enhance better business performance.

Even though management and organization development have been studied in vast amounts, there are only a few studies in which the results can be generalized to benefit the organizations generally. Awareness of both teamwork and employee well-being meaning for organization's performance has increased. Many studies indicate that certain human resource practices have improved the organization performance, but are lacking the explanatory power and generalizability.

In this research the human tacit signal development process is evaluated using practical case studies and scientific methodology. Also the human factors are considered in the research in the competence based organization system intelligence model, describing the organization complexity and dynamic nature. This system intelligence model is built from human competencies that are interacting with each other causing tendencies to support or prevent the organization development. Because organization is dynamic, a need for dynamic heuristic development process that adapts to the situational human development needs is required

Management should understand the phenomenon of how effective organizational development of human resources simultaneously improves the

well-being and business performance. According to the research results of this study, the tacit signal development process seems to be effective method in the improvement of organization performance at certain circumstances. The practical findings from human based organization performance development can be explained with theoretically consistent calculations, that increase the reliability of evidence based management.

Keywords: Tacit signal, human capital, human competence, organization development, workplace innovation, HRM-P, HRM, HRD

Tiivistelmä

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Tämä väitöstutkimus koskee organisaation suorituskyvyn kehittämistä hiljaiset signaalit -menetelmään pohjautuvaa kehittämisprosessia käyttäen. Hiljaiset signaalit ovat organisaation inhimillisiin kompetensseihin kohdistuvia toimintaa ohjaavia mielipiteitä ja tuntemuksia, jotka kumpuavat henkilöstön hiljaisesta tiedosta. Hiljaiset signaalit menetelmään perustuva kehittämiskysely antaa toimintaa ohjaavaa tietoa kehittämisprosessiin, jonka tuotoksena toteutetaan optimaalisia työelämäinnovaatioita työyhteisötasolla. Optimaaliset työelämäinnovaatiot ovat kollektiivisesti sovittuja toimenpiteitä, joilla parhaiten parannetaan työyhteisön kyvykkyyksiä ja suorituskykyä.

Tutkimuksessa selvitetään organisaation inhimillisten kompetenssien kehittämistä ja sen liittymistä suorituskyvyn (performance) parantamiseen työyhteisö- ja organisaatiotasolla. Niinpä tutkimuksessa voidaan nähdä kaksi tärkeintä tavoitetta: selvittää hiljaiset signaalit kehittämisprosessin vaikutus organisaation kehittämiseen ja suorituskyvyn parantamiseen sekä lisätä tutkimustietämystä henkilöstölähtöisen kehittämisen vaikutuksista liiketoiminnan tuloskortteihin. Hiljaiset signaalit kehittämisprosessin tapaustutkimusten avulla haetaan vastausta siihen miten vaikuttavuudeltaan tehokas kehittäminen tulisi toteuttaa ja mikä ilmiö selittää henkilöstökehittämisen ja organisaation suorituskyvyn välisen yhteyden.

Johtamista ja organisaation kehittämistä on tutkittu paljon, mutta tutkimustuloksia on jokseenkin vaikea hyödyntää organisaatioiden kehittämiseen käytännössä. Tutkimusten myötä on lisääntynyt tietoisuus siitä, että henkilöstövoimavaroilla on suuri merkitys organisaatioiden suorituskykyyn. Useat tutkimukset viittaavat siihen, että henkilöstölähtöinen organisaation kehittäminen on parantanut organisaation suorituskykyä, mutta eivät kerro miksi näin tapahtuu. Yksi tutkimuksen tavoitteista on selittää miten henkilöstön kehittäminen vaikuttaa organisaation taloudelliseen menestykseen. Jotta henkilöstölähtöistä kehittämistä voidaan tehdä tehokkaasti, on ymmärrettävä mistä suorituskyvyn nousu syntyy.

Tässä tutkimuksessa tarkastellaan yhtä henkilöstökehittämisen ratkaisua kriittisesti, tieteen tutkimusperiaatteita noudattaen. Tutkimuksessa otetaan lisäksi huomioon se, että organisaatio on inhimillisistä tekijöistä johtuen kompleksinen ja dynaaminen systeemi, jonka mekanismien havainnollistaminen vaatii poikkitieteellistä ajattelua. Tutkimuksessa esitellään inhimillisistä kompetensseista rakentuva organisaatiosysteemi, jossa kompetenssien muodostamat inhimilliset voimatekijät vaikuttavat vuorovaikutuksellisesti toisiinsa. Näin voidaan havainnollistaa inhimillisiä kompetenssitekijöitä, jotka voivat sekä edistää että vaikeuttaa

organisaation kehittämistä. Dynaamisen luonteen omaava organisaatiosysteemi vaatii dynaamisen kehittämisprosessin, joka mukautuu organisaation tilanteeseen ja huomioi henkilöstön hiljaisen tiedon tärkeyden.

Johdon tulee ymmärtää ilmiö, jossa henkilöstöresurssien tehokas kehittäminen parantaa sekä henkilöstön hyvinvointia että tuottavuutta (suorituskykyä) samanaikaisesti. Tutkimuksen tulosten perusteella hiljaiset signaalit -kehittämisprosessi vaikuttaa dynaamiselta ja tehokkaalta ratkaisulta organisaatioiden suorituskyvyn parantamiseen tietyissä olosuhteissa. Käytännön toimintatutkimusten havainnot henkilöstölähtöisestä tuottavuuden noususta ovat selitettävissä tutkimuksessa esitettävällä teoreettisesti johdonmukaisella laskentamallilla, mikä lisää tieteelliseen näyttöön perustuvan tutkimuksen luotettavuutta ja arvoa.

Asiasanat: Hiljainen signaali, henkilöstöpääoma, inhimillinen kompetenssi, organisaation kehittäminen, työelämäinnovaatio, HRM-P, HRM, HRD

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Definition of key terminology used in the study

Business performance describes organization performance in terms of business account scorecards, revenue, gross profit and HCROI.

Effective working time describes the work labor capacity that derives the organization's revenue.

Evidence-based management (EBMgt) is the systematic use of best available evidence in order to improve management practice (Pfeffer and Sutton 2006; Rousseau 2006).

Gross margin (same as sales margin) is the revenue of the organization or its business unit deducted with variable costs.

HCROI (Human Capital Return on Investment) is an index describing the organization's or its business unit's human capital productivity. HCROI is calculated by dividing the gross margin with staff costs.

Human capital can be described as the organization's capacity to use resources and competencies in order to achieve goals (see Ulrich and Brockbank 2005).

Human competencies are the organization's human drivers of performance that can be identified by management, leadership, culture, skills and process.

HRD is human resource development.

HRM is human resource management referring to management activities in the employment relationship.

HRM-P is the research dealing with the Human Resource Management (HRM) relation to organization performance.

Optimal workplace innovations are collectively agreed upon optimal improvement actions that are derived from the tacit knowledge of the members of the working society.

Organization intelligence defines how organization's different competencies and capabilities are systematically utilized to improve performance and achieve strategic goals.

Quality of Working Life (QWL) is the subjective feeling of the staff concerning their personal well-being and their working society as well as the well-being of the organization.

Scenario-analysis combines the effects of a multitude of variables on the organization's human capital performance, making it possible to perform scenario calculations for the future, illustrating the benefits derived from sustainable and systematic human capital development.

System intelligence model describes the interrelationships of human competencies (management, leadership, culture, skills and process) to help perceive the organization as an intelligent system.

Tacit signals analysis is the vector calculation analysis of the collective tacit signals illustrating development needs concerning the competencies or competence attributes.

Tacit signals are situation-based human opinions that include guiding information for the possible improvement of measured competencies.

The tacit signal development process is a systematic process for creating, agreeing upon and implementing of optimal workplace innovations in the working societies in order to improve performance and wellbeing.

Tacit signal method is the methodology and principles that are used for gathering information and knowledge using situation-based human opinions called tacit signals.

Working society is a working group or a team within the organization, created by its members for performing common tasks and achieving goals.

List of Publications

The frame for this dissertation is created with the publications of the original thesis articles. The first article introduces the tacit signal method and background for human resource development (HRD) process. The second article presents the first findings of the tacit signal method in use at systematic organization development. Whereas article two contains the findings from the beginning of the longitudinal case study, article three presents the latter part of the case study with more profound information and description of human competence system intelligence model. Finally, article four combines the study thematic and represent the plausible mathematical causal-explanatory rules that form human capital scenario analysis tool, and illustrates that there seems to be logic and a pattern of how organization development produces business performance. In addition, the last article proposes findings that will hopefully inspire future discussion and research.

Kesti M., Syväjärvi A. & Stenvall J. (2008). E-HRM in Competence Recognition and Management. In Torres-Coronas, T. and Arias-Oliva, M. (eds.) *Encyclopedia of Human Resources Information Systems: Challenges in e-HRM*. Information Science Reference, IGI Global, USA. pp. 293–300.

Kesti M., Syväjärvi A. & Stenvall J. (2009). Hiljaiset signaalit HRIS: yksi ratkaisu organisaation inhimillisen pääoman ja henkilöstötuottavuuden kehittämisessä. *Hallinnon Tutkimus*, Vol. 28(1), 46–61.

Kesti M. & Syväjärvi A. (2010). Human Tacit Signals at Organization Performance Development. *Industrial Management & Data Systems*, Vol. 110(2), 211–229.

Kesti M., Syväjärvi A., Stenvall J. & Rivera M.A. (2011). Human capital scenario analysis as an organizational intelligence tool for performance management. *Problems & Perspectives in Management*, Vol. 9(1), 46–58.

Preface and acknowledgement

The research for a doctoral thesis concerning the use of tacit signal method in the development of organizational capabilities started in 2005. One of the driving forces behind the dissertation was the preliminary studies indicating that tacit signal method could be an effective method in organization development, contributing to the improvement of organization performance. Using empirically grounded research I wanted to study the tacit signal method in the development of organization human competencies and business performance.

The expectation was that the tacit signal method could provide new approach and new possibilities for organization development. Preliminary cases showed that tacit signals gave constructive information for the brainstorming of improvement ideas, from which the most optimal ones could be chosen for implementation. Hence, formed human competencies development process was discovered to be promising and it seemed to give excellent value for the time spent. However I did not dare to expect that the study would yield so much information on the field of organization development.

It is clear that this study could not have been done alone. Collaboration with Jaana Turunen, Antti Vuolteenaho, Tauno Hepola and other Mcompetence team members have been fruitful. However, the single most important aspect of this study has been the co-operation with our case companies and organizations.

I wish to thank the Finnish Workplace Development Programme for supporting organizations development projects. I would also like to extent my thanks to pension insurance pension insurance company Ilmarinen for co-operation in developing the human capital analyzing. I give warm thanks to the publishers of the research articles used in this study, IGI Global, Emerald, Finnish Association for Administrative Studies and Business Perspectives.

I would like to give special thanks to the Finnish Work Environment Fund (TSR) for supporting my dissertation. I have had great possibility to collaborate with academic professionals like Professor Mario Rivera who has helped me writing the article dealing with human capital scenario analyzing. During my long journey of research I have had valuable advice

and help from the great Professors Antti Syväjärvi and Jari Stenvall. I believe our research cooperation will be flourishing also after my thesis. Furthermore I want to thank Docent Petri Virtanen and Professor Jari Vuori whose constructive critics have urged me to improve my thesis quality. I also wish to thank my family and especially my sister Terhi Kesti, who has encouraged me along my challenging studies.

1 Introduction

The dissertation deals with organization's human performance improvement through systematic HRD process. One of the most important functions for human resource management (HRM) is to add competitive business value to the organization (e.g. Pfeffer 1994; Ulrich 1997; Guest 1997; Becker & Huselid 2006). Adding competitive business value means that besides administration HRM has to succeed in implementing chosen human resource practices for creating 'competitive advantage through people' (Pfeffer 1994). In this dissertation the focus is on tacit signal HRD process in use of human competence based performance development.

The interest at human resource management connection to business performance (HRM-P) have increased along with the knowledge on business scorecards metrics and their linkages to HR scorecards (e.g. Business Score Card and Strategy Maps of Kaplan and Norton 1996 and 2004; HR scorecard of Becker et al. 2001; HCROI of Fitz-Enz 2000; IIP of Cascio & Boudreau 2008). Guest et al. (2003) study indicates that business profitability may give scope for more HRM rather than vice versa. There is also a multitude of HR-practices which have indicated to support positive correlation with business performance, for example:

- Ichniowsky et al. (1997): innovative HRM practices raised worker productivity
- Huselid (1995) and Becker & Huselid (1998): High Performance Work Practices improved employee performance
- Guest (1997): HR practices which have good fit with strategy, policy and context, seem to be associated with superior performance

Even though the configuration of certain bundle of HR-practices seem to promote better performance (see e.g. Lumijärvi 2009), several open questions remain in utilizing the research outcomes in practice. Totterdill et al. (2002) argue that organizational innovations are not rational and the attempt to capture them with copying other organizations' best practices will cause major failures. Several researchers argue that there seems to be too little effort in solving the mechanism of how HRM

actually influences organization performance (Guest 2001; Paauwe 2004; Becker & Huselid 2006; Lumijärvi 2009; Fleetwood & Hesketh 2010). There have also been problems in generalizing the HRM-P research outcomes because situations, organizations and their people are so different (see Ramsay et al. 2000; Guest 2001; Sila 2006; Fleetwood & Hesketh 2010). For example, Ramsay et al. (2000) tested three models from High Performance Work System (the High-Commitment Model, the High Involvement Model and the Labour Process Model) and found no adequate account of the outcomes.

Boudreau and Ramstad (1999) point out that measurement framework is needed for developing theoretical logic to support the inference that investments on human resource strategies lead to organizational success. They also argue that it is incumbent on measurement developers to provide a theory-based framework, not simply an ever growing list of new measures. Fleetwood and Hesketh (2010) encourage new researchers to find out new methods and techniques for understanding how for example line managers might persuade, induce or encourage employees to do as good a job as possible either better or more innovatively. They argue that this is almost certainly going to require far more sophisticated, in-depth, qualitative research techniques than Likert scales (Fleetwood & Hesketh 2010).

Thus it seems evident that HRM-P and HRD are areas needing research contribution and therefore giving justification for this dissertation. The tacit signal method in use at organization human resource development could give new information on how to empower human resource in creating better organization performance. However, there should be a theoretically sound explanation to why applied HR activities create better business performance, for it is not sufficient enough to just claim they do so. The data has to make sense so that it can generate grounded theory based on the evidence. This study tries to make sense of the case data and find out plausible explanation why systematic HRD process may improve organization human competencies and business performance.

The starting point of the study is the introduction of the tacit signals method for measuring employee development needs concerning the chosen competencies. Competencies can be seen as human capabilities that can be utilized in organization working groups as drivers of

performance (Pietiläinen 2010). Fleetwood and Hesketh (2010) suggest that workers have causal powers or competencies that certain HR-practices might actualize, generating high value-adding behaviors. Research study indicates that human competencies, categorized to management, leadership, team culture, working skills and processes, seem to be linked to one another, having certain system of causal powers over each other.

Tacit signals are feeding the necessary guiding information for the human resource development process so that working group collective improvement actions can be created and agreed on. Optimal workplace innovations are collectively agreed upon optimal improvement actions that are derived from the tacit knowledge of the members of the working society. When these work related improvements are implemented effectively there seems to be tendency for performance increase. Performance increase appears to be the outcome of optimal workplace innovations, which are created through this rather complicated hermeneutic tacit signal development process.

The tacit signal development process seems to have a positive effect to human competencies and business performance. This phenomenon, which was discovered based on empirical action research, is being studied by using scientifically oriented practical approach. Scientific methods (measured data, literary reviews and statistical analysis) do not seem to explain why competencies improvement through workplace innovations improves organization performance. To explain empirical findings the *theory of effective working time productivity correlation* was created. This HRM-P theory's logic has been tested by forming HCROI scenario analyzing methodology.

1.1 Research tasks

In this dissertation, the organization performance means the improvement of business performance (revenue, gross profit, HCROI) and human competencies. Human capital return on investment (HCROI) is calculated by dividing gross profit with staff costs; its change representing the change in human capital productivity. The human competencies are measured using the tacit signals. The empirical findings and data are

collected from case studies using longitudinal action research. Data is analyzed to find out possible pattern and correlation between chosen variables and empirical findings. Probable causal relations between tacit signal HRD process and performance scorecards are critically evaluated and plausible scientific explanation formed. This is essential when making an academic contribution for further research in the area of human resource management practices in organization performance development.

During the process of making the dissertation, the tacit signal HRD process was implemented in several action research cycles. After each cycle, the results were critically analyzed, and if adequate targets were not achieved the HRD process was further improved.

The objectives of this study are as follows:

> To develop an effective human resource development process based on the tacit signal method (tacit signal development process) and test it using empirical case studies.
>
> To find a possible connection between the tacit signal development process and organization performance improvement.
>
> To create a plausible explanation why effective organization human competence development (tacit signal development process) may generate better organization business performance.

These objectives are challenging and even partially succeeding would give a good contribution to the research in the area of human resource management connection to organization performance (HRM-P). Hopefully this research is adding value to the HRM-P discussion and evidence-based management (EBMgt) when studying and analyzing the effectiveness of the HRD process as a human resource management practice for improving business performance in organizations.

1.2 Research structure

The research is based on four articles from the thesis as well as on the supplementing research findings. The foundation of the study is in the tacit signal innovation that is introduced in detail. Tacit signals

are situation-based human opinions that have guiding information for possible improvement. Prior to this research a thorough development and testing has been conducted on practical cases in different organizations.

The action research method with evidence based management principles is used in the study and is introduced in the research methodology. The chosen variables are introduced and a wide range of possible sources of errors are discussed under the research methodology section.

The evolutionary development of the tacit signal method in human-based organization performance development in connection with human resource management (HRM) is described in the section dealing theoretical HRM-P framework and tacit signals. Human-based organization performance development means that utilizing the personnel's tacit knowledge it is possible to gain better business performance. The theoretical framework is introduced as possible phenomenon at HRM-P.

When deciding on organization development inquiries there are two main issues to consider: firstly, to acquire reliable information from the organization and secondly, to acquire the information in a way that enables it to be utilized in effective organization development. Effective development means in this research context that each working group is able to begin the most optimal improvement actions in short notice. These optimal workplace innovations are situation- and group-based collective optimal actions that improve the competencies and performance within the group. The aim is to develop the group's competencies through optimal workplace innovations and thus improve the organization performance that can be measured with business scorecard changes; revenue increase, gross margin increase, HCROI increase and finally by average increase of revenue multiplied with the HCROI increase.

The tacit signal concept was introduced in an international science forum in the article that was published in the Encyclopedia of HRIS (Kesti et al. 2008). The findings of the tacit signal action research case study have its own section in the study. The most essential findings regarding the method have been collected there. The human competence system intelligence model is presented at the article published by Emerald Publications at the Journal of IMDS. The competence system intelligence model is connected with the tacit signal method since organization

competencies can be analyzed using tacit signals. Examples of essential competencies as drivers of performance are presented in the articles two (Kesti et al. 2009) and three (Kesti & Syväjärvi 2010). Articles present the tacit signal development process for improving chosen competencies. This process is examined more thoroughly in the section dealing HRM, action science and tacit signals.

Utilizing the knowledge and theoretical association with practical findings, the human capital scenario-analysis tool was formed and introduced in the fourth research article which was published in the Journal of Problems and Perspectives of Management (Kesti at al. 2011). Article presents practical testing of thesis theoretical framework in form of HCROI scenario-analyzing tool. Scenario-analysis combines a multitude of variables that were discovered to have an effect on the organization's human capital performance, making it possible to predict plausible scenarios for the future. The scenario-analyzing combines HRM-performance principles, thus making it possible to test whether predictive power, which is in line with longitudinal action research case, can be achieved.

Information communication technology may give essential tools for effective organization change management and thus successful performance development. The article 1 presents tacit signal method in connection to human resource information system that supports the human behavioral realities in the organization management and development. Tacit signal HRD process and its effect on the organization competencies and performance are evaluated to figure out if business performance improvement can be achieved from effective competence improvement. The evolutionary development of the tacit signal HRD process is visible in the two following articles (articles 2 and 3). The second thesis article presents the findings from the first research case cycle; later forming the longitudinal business case which is presented in the third article.

According to the study's theoretical HRM-P orientation and research findings it is possible that each group competencies as drivers of performance correlate with the group's performance. Therefore, the management should pay attention to both the average competencies in the organization and the distribution of competencies in working

groups. The case data analyzing reveal organization development leverage phenomenon. This phenomenon is interesting and needs further studies, for it might have an important role in organization human resource performance development.

The articles, on which the thesis is based, depict the cross-sections of the evolutionary development in the action research, dealing with the tacit signal method in effective human competence based organization performance development. The scientific value creation progress is illustrated in figure 1.

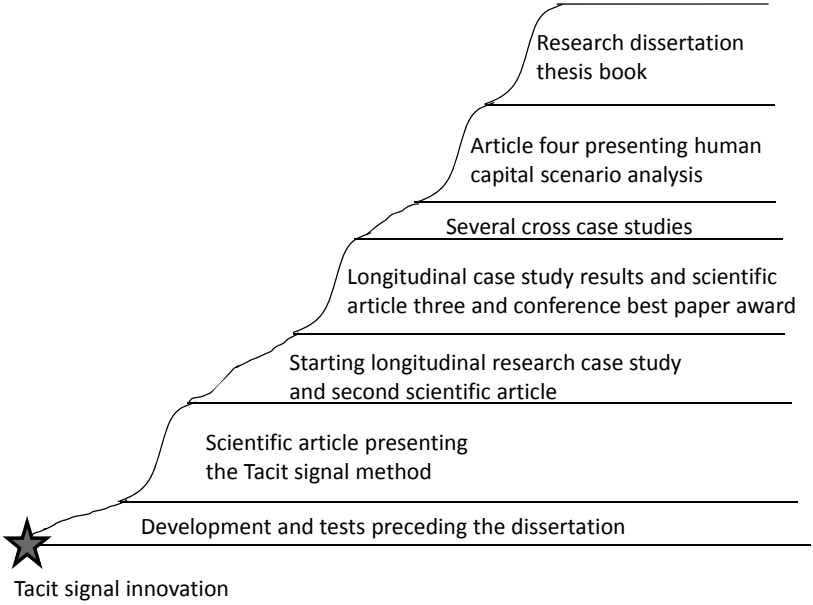


Figure 1. Figure illustrates the scientific value-creation concerning tacit signal innovation.

2 Theoretical foundation and research methodology

According to March and Smith (1995) and Hevner et al. (2004) there are four types of design science products: constructs, models, methods and instantiations. The construct defines the terms and definitions as the language of the domain. A model of propositions or statements is set to express relationships among the constructs. The method is a set of steps forming the algorithm used to perform the anticipated task. The instantiation is the realization of the innovation that is utilized in its environment (see also Järvinen & Järvinen 2004). The basis of the dissertation lies in the tacit signal method that can be seen as an intrinsically interesting innovation, which was formed from the researcher's experiences in the working life and the interest in management and organization development. Regarding the tacit signal method, the research will follow the definition of design science innovation by March and Smith (1995) and Hevner et al. (2004).

As a construct, the definition of the tacit signal in this research is human guiding opinion that is based on the individual's tacit knowledge and can therefore be utilized in the development. The distinction between a weak signal and a tacit signal is that the tacit signal is always based on human beings' knowledge and experience. Weak signals are those early warning signals of certain important phenomenon that indicate the future risks or opportunities (Day & Shoemaker 2006). Tacit signals are guiding opinions related to the development needs that person feels.

In this research the tacit signals are utilized at human resource development where the aim is to improve human competencies and business performance. To succeed in this target there are set following propositions and hypothesis:

- The staff of the given organization has tacit knowledge that can be utilized in the development by measuring tacit signals related to those competencies recognized as important organization drivers of performance. Tacit signals can be analyzed mathematically and visualized by using vector graphics.

- By utilizing tacit signals in the development of the working society, it is possible to agree about the ideal improvement actions that can be seen as optimal workplace innovations.
- Implementing the most optimal workplace innovations, the group should be able to improve their measured competencies and group performance.

The tacit signal development process forms a methodology for gathering necessary information from human competencies and utilizing it to improve the working society's performance and competencies. Later on in this research the tacit signal development process will be examined in detail as a function of systematic human resource development (HRD).

The tacit signal instantiation will be studied through a longitudinal case study. The HRD process' aim is to improve organization performance and measured competencies. The tacit signal based organization development will apply human resources, tacit knowledge and facilitating services in order to achieve better business performance.

2.1 Background of tacit signal method

The tacit signal method can be seen as new methodological innovation for measuring human opinions. To understand the background for this innovation, it is important to describe the researcher's personal beliefs, interests and experiences that have led to the building of tacit signal innovation (see also Denscombe 2010). There seems to be a certain kind of state-transition in the heuristic process that can be recognized from the beginning to the state when this research was first started (see Järvinen & Järvinen 2004).

The driving forces behind the tacit signal innovation were the basic problems that were perceived in the researcher's own experience of working life:

- how the opinions of the staff could be better taken into consideration in the decision-making

and

- how the staff could be better involved in the organization's development.

The most profound sources of inspiration come from the background literature, including "The Balanced Scorecard" by Kaplan and Norton (1996), "The Knowledge Creating Company" by Nonaka and Takeuchi (1995) and "The Fifth Discipline" by Senge (1990). Aforementioned books seem to contain a philosophical approach and it can be seen of importance in organization's balanced development and on the drivers that influence the optimal balance. The development of the tacit signal innovation preceded some philosophical thinking related to Japanese TAIDO, which includes harmony between body and mind. Furthermore, there has been a personal interest towards Chinese acupuncture where the human being is regarded as a holistic being; unbalance may cause illness. The aim of the treatment is to restore the balance of yin and yang. This philosophy then linked with working life experience raising a thought whether the same principles could be used in organization development.

Organization is a complex social system that may be out of its balance, causing different kind of symptoms like mistakes, poor quality, lack of innovativeness and increased absence. Should such situation occur, the best way to prevent negative cause and effect from happening is via improvement and regaining of balance. Employees can sense the unbalance in their tacit knowledge, but they cannot see the complex cause and effect relation. If tacit knowledge could be measured, it should be possible to restore the balance with the optimal improvement actions.

Tacit signals are personal guiding opinions on the development needs, focusing on matters that are important for the success of the organization. The results are presented by using a visual vector analysis illustratively (tacit signal analysis), so that the information can be presented unambiguously and mathematically in a valid form. The mathematical mode of representation that is based on the vector calculation is familiar from the engineering sciences where it is used in calculations that describe, for example, the mechanisms of statics and dynamics. The Foundation for Finnish Inventions studied the tacit signal innovation's novelty value and stated that it was a new methodological innovation worldwide.

According to the researcher's experiences, the job satisfaction survey results tend to be examined quickly by the management team and forgotten about afterwards. It may be because of that particular matter that the survey method based on situational analysis brings up more questions

than it is able to provide answers with (see Elo et al. 2010). It is clear that the staff opinions should be the basis for the development and therefore paid attention to. However, it should be conducted in a different way so that the results could be used to improve the organization instead of merely stating the possible problems. It would be ideal if the organization inquiry led to corrective actions immediately and in such way it would strengthen the social collaboration and balance within the group. When in balance, the human being is naturally learning and innovative, thus contributing best personal performance (Vygotsky 1978; Senge 1990).

According to the cases preceding the research the development actions were relatively easy to agree upon within the working societies based on the tacit signal analysis. Development meetings were held in the organizations soon (preferably within one month) after the tacit signal evaluation. Agreed upon development actions varied from group to group which supported the contingency theory (ref. Hunt 1992; Greenberg and Baron 1995). It was evident, from the scientific research angle that the tacit signals as a new organization development method was intrinsically interesting.

2.2 Original cases preceding the research

Yin (1989) recommends that before the actual research case studies it would be good to have test cases to solve possible methodological problems and learn more about the upcoming research subject matters. During the years 2002-2004, several customer (N=4) and organization development surveys (N=10) were conducted using the tacit signal method (see appendix 1). Altogether there was gathered and analyzed 5680 tacit signal inquiry answers from various (N=14) different organization specific measurements. After the organization development surveys, meetings were held for planning the development actions. These cases where essential for learning more about the tacit signal method and human resource development prior to the research case studies (see Yin 1989). All the test cases were carefully planned and results were analyzed in practice with the customers.

2.3 Research methodology

The evidence-based management (EBMgt) is the systematic use of the best available evidence to improve management practice (Pfeffer and Sutton 2006; Rousseau 2006). EBMgt can be seen as a general research methodology for improving the management's decision-making in the business enterprises (Drucker 1955; 1967). The basic idea is that management needs reliable evidence in their decision-making, for example, concerning the human resources, finance, accounting and health care management (see Reay et al. 2009). According to Kovner and Rundall (2006) the organizational performance (profitability or other measures) should be improved as a result of adopting EBMgt. Reay and her colleagues (2009) argue that 'laudable management research must generate innovative findings and also make a strong contribution to theory'.

According to Ruspini (1999), repeated cross-sectional studies can be classified as a longitudinal study. The longitudinal research data was collected during two or more distinct periods, from cases that are the same or at least comparable with one another from period to period. This longitudinal data is compared between the different periods. The research case study in a large business corporation meets the criteria, as it includes 19 similar business units. Each unit has its own staff, forming together geographically and professionally delineated populations (rf. cohorts) who experience the same significant working life event (development process) within a given period of time (see Ruspini 1999).

The collected data was compared using data tabulation method where quantified data (chosen variables) is categorized and compared between different periods in order to find patterns and relationships (see Cunningham 1997; Denscombe 2010). The aim is to make sure that research assumptions and findings are proven plausible through statistical correlation tests, and thus supporting the EBMgt. Verifying the tacit signal development process's effectiveness is important, because human beings must be able to base their behavior on it reliably (see Järvinen and Järvinen 2004).

According to Popper (1968) and Lee (1989) the scientific theory should satisfy the following requirements:

1) Empirical validity. Do the case studies support it?
2) Logical consistency. Are the predictions consistent with each other?
3) Relative predictive power. Is the theory at least as explanatory or predictive as any competing theory?
4) Falsifiability. Can the theory survive the actual attempts of its falsification?

Markus (1983) emphasizes that a theory can be tested in two ways: 1) theories are examined and compared with the facts in the real world; and 2) the implications for action derived from theories can be tested for their usefulness to implementers. Furthermore, Markus suggests that predictions or propositions derived from theories can be tested against observed occurrences. In this research, the consistency of the theory will also be tested by forming mathematical simulation formulae which predict the anticipated phenomenon discovered in the case studies. It can therefore be used in scenario planning. Simulation can be seen as a research method where changes in the essential qualities of reality can be determined without the reality itself (Järvinen and Järvinen 2004; Eriksson 1990; Greenblat 1988).

When creating theoretical explanations, the grounded theory approach that meets the Strauss and Corbin (1990) criteria has been used. The research will be in line with several existing hypothesis in scientific literature and practical reality with the experiences from case studies. The thesis theoretical HRM-P framework will make sense of the findings and support the understanding of the nature of organization development. The findings are based on best available data that are analyzed with tabulation method and statistical correlation tests. In addition to the longitudinal study, there are several cross-studies that will increase the variation on which to ground the phenomenon that has been found. The thesis case studies are carried out using action research where the development process is controlled and repeatable. Mason (1988) points out that "interposing of control into an experiment is important because the purpose of experimentation is to produce certified practical knowledge."

A wide range of scientific literature has been used to describe the theoretical background as well as the latest research on the subject.

In addition to the articles from scientific journals, there are literature references from research reports and publications from academic authors and for that reason they can be included in to the scientific literature (see Strauss and Corbin 1990).

Throughout the research, there has been a mindset of explaining the findings and observations by analyzing the case data, and if needed, to generate new phenomenon that would explain the organization performance development and yield general knowledge of organization performance development that could contribute new grounded theories in the future. Goulding (2002) states that "Usually researchers adapt grounded theory when the topic of interest has been relatively ignored in the literature or has been given only superficial attention."

Action research method is used in the case studies, with the aim of improving subject organization performance in practice. This approach is suitable, since action research is closely related to the idea that change is good (Denscombe 2010). According to Susman and Evered (1978), action research can be characterized with the following six properties: future oriented, collaborative, implies system development, generates theory grounded in action, agnostic and situational. Hult and Lennung (1980) point out that action research simultaneously assists with practical problem solving as well as expands scientific knowledge. They also enhance the participants' competencies in a collaborative development process, which are also considered characteristics in this research.

Action research is a cyclical process, and its essential points are that the research provides direct feedback in practice, and that the process is ongoing (Denscombe 2010). This research has been a cyclical process for a period of several years, including longitudinal case studies and several cross-studies (see appendix 2). These cycles, where research and action are integrated form an evolution of learning. In action research the aim has been to improve the target organization's productivity, verify the effectiveness of the tacit signal development process, and also to ground the theory that explains the practical findings in a way that can be generally useful for educational purposes in organization human resource management and performance improvement.

The effect that the tacit signal development process has on organization productivity was evaluated using three tacit signal based action research

cycle studies within the same organization, thus forming longitudinal research (see Ruspini 1999).

The research longitudinal case study was done at Starkki. Starkki is a Finnish chain of builders' merchants with a business model based on large stores and well-trained specialist staff. Local building contractors are the largest single customer segment, however consumers and small retail stores have significant role generating nearly 50 per cent of company's revenue. Starkki has a strong record of profitability based on efficiency and a low cost base. Starkki is part of Wolseley Corporation which is the world's largest trade distributor of plumbing and heating products and a leading supplier of building materials. Each of company's businesses aims to grow profitability faster than the competition. To achieve this goal, each business unit focuses on achieving best customer service, best branch staff and preferred vendor relationship.

Longitudinal research was carried out in 19 business units with approximately 1000 employees (N=965, 2005/2006; N=1065, 2006/2007; N=1168, 2007/2008). The research was initiated first in five business units where the tacit signal development process was carried out in the end of the year 2005. The other 14 unit's tacit signal development process was carried out in the beginning of the year 2006. Altogether this first cycle consists of the whole organization's tacit signal analysis, representing the realization of the business scorecards of the year 2005. The business scorecards were monitored through the years 2005, 2006 and 2007, during which the represented tacit signal competencies were also measured. In the course of each cycle, the process was improved which is characteristic of longitudinal action research (see Denscombe 2010).

The longitudinal case study was intrinsically interesting from the research point of view (see Fleetwood & Hesketh 2010, page 240): the company consists of 19 separate, yet similar business units which all performed the same business process with the same base knowledge resources; with similar HRM practices and customer products and conducting business in a relatively similar market area (Finland). Furthermore, the research was carried out in a steady growing economic situation where the Finnish economy's productivity growth during the years 2005 to 2007 was from 1.5 to 3.1, reducing to -0.4 in the year 2008

(Pasanen 2008; 2010). Therefore, the period of 2005 to 2007 represents a steady growth, as well as minimum sources of errors in the economic point of view. During the research period, the tacit signal development process was the only systematic organization development activity that was performed within the whole organization.

Along with the longitudinal research there were multiple case studies that made it possible to reconfirm some of the empirical findings during the course of the longitudinal research. In addition, these multiple cases represented different types of organizations in several business branches and municipal organizations. Therefore, the research credibility could be increased, however later case studies included several crucial intervening variables like economic recession, laying-offs and organization down-sizing which may contaminate the findings. The aim of the research is to use evidence-based management (EBMgt) in the study of the effectiveness of the tacit signal development process as a HR management practice in the improvement of organization performance.

2.4 Introduction of variables

Variables can be classified into three categories: independent variables, dependent variables and intervening variables (Järvinen 2004). Independent variables are the ones that the researcher can decide on and manage together with the organization's management and action research participants; in this case the implementation of the tacit signal process and the group structure. The dependent variables are those that can be influenced by independent variables together with possible other variables (dependent and intervening). Intervening variables cannot be influenced, but they are influencing the dependent variables. Research variables are listed at the appendix 3. In addition, there are multiple possible sources of error that may influence all variables and may contaminate or terminate the research. These sources of error are prevented or minimized in the best way possible.

The staff's absence can be considered as a dependent variable. However, in this particular longitudinal case study the staff's absence was much below the business branch's average and its effect was considered to be

non-existent. In addition to the quantitative data there are qualitative observations and participant opinions that are used for verifying the data and for creating grounded theories that describe the mixed data findings. Although there is a significant amount of participants' written comments supporting the findings, the main focus is on quantitative data processing. As an example of a qualitative observation is that the tacit signal method seems to help the working society to solve problems constructively, since the actions were able to be agreed upon and the atmosphere during the development meetings was pleasant.

Sources of errors that had an effect on the case population were yearly employee turnover and staff increase. Both of these error sources were chosen as variables describing the structural change in each business unit. This stability in the case parameters made it possible to conduct the tacit signal development process' (action research) cause and effect relationships and correlations between the variables.

2.5 Sources of error

It is worth noticing that during this kind of research sources of errors appear, such as staff turnover and changes in working groups that may cause significant structural change that intervene with the achieving of action research targets, and may contaminate the identification of causalities. When staff turnover and increase (or decrease) stays within reasonable measures, they can be considered as intervening or dependent variables. This question deals with the acceptable confidence decrease that is caused by change of group population. In the longitudinal study, one business unit was terminated during the research period and therefore excluded from the study. In other respects, all the business units are taken into account. Some of them, however, had significant staff turnover or growth.

Staff turnover was relatively high due to the variation in the need of capacity which is characteristic of the business branch. These intermediate variables were considered by choosing the dependent variables in a way in which the impact of error is minimized. However these intervening variables tend to act against the target, there are so many cases (19)

where the positive effects seem to override the negative. Most of these intervening variables and error sources may be considered characteristic of the organization's lifecycle, and have to be accepted as they are.

The error sources should be identified for organization development management purposes. The error sources of the tacit signal Internet inquiry are usually disturbances when employees are inserting their opinions and ideas of possible problems for using eHRM inquiry system. The employee may not have adequate skills for using the internet or there might be problems with the internet connection. These error sources can be minimized with adequate information and by testing the system before implementation (e.g. firewall settings). In addition, the employees should be provided with enough undisturbed time for answering. The required time consumption can be minimized by choosing only the most important competence items to be included in the inquiry. According to practical experience, the answering of all competence inquiries should not take more than 30 minutes. In addition, it is possible to get online help for the answering process whenever necessary.

It is essential that competence items in the inquiry are familiar to the staff. They should also be meaningful, which is essential for motivation. To minimize possible misunderstandings and to eliminate needless attributes, the tacit signal inquiry must be edited to suit the particular organization. The language to be used must be in accordance with the language used in the organization, and it should preferably be the participants' native language. In case of multiple languages, the participants can choose their own language. The inquiry should be validated for multiple languages. In the longitudinal research, all the inquiries were carried out using the participants' native language (Finnish). There was also one cross case study where the tacit signal development process was carried out successfully in a group in Estonia, using their native language.

The model for the competence items was condensed from relative literature studies, well-known welfare questionnaires and personal experiences of multiple test cases (see article 3 and Kesti 2005). It was discovered that the model created for competencies and competence attributes were relatively successful, since the specialists from organizations had very few needs for revision. The longitudinal study included a set of competency inquiries of leadership, culture, skills and internal

communication. Later the skills and internal communication inquiries where replaced by process development inquiry. In the longitudinal research, the leadership and culture competence inquiries were repeated without changes. Leadership and culture competencies were found most significant for development purposes at the longitudinal case and they seemed to correlate best with the followed variables (see article 2 and 3).

One error source that could cause significant contamination was related to the group's homogeneity. The minimum group size is five persons due to privacy issues. If two groups are merged, for example, to form a larger group there is a great risk of contamination. If these groups have different development needs, the mixed answers will not show the optimal development needs for either of the groups. In a case where two or several groups are merged for the survey, the groups have to be in close working relation with each other so that they add value to their working process. This way the possible contamination can be minimized and collective development needs should improve the performance, since they all add value to the same process.

After the tacit signal inquiry, there will be a cooperative group development meeting in each of the working societies. There are several potential error sources that may disturb the execution of this development meeting. First potential error source is the time gap between the inquiry and the meeting. Experience has showed that this time gap should be less than one month to maintain the participants' motivation for change. Longer time gap may lead to a change in situation, for example, problems may have escalate to conflicts. Therefore, the optimal development actions are easier to find and agree upon when the time gap between the inquiry and the group development meeting is as short as possible.

When conducting the development meeting the participants may be tempted to handle their own issues or work issues during the meeting. This possibility has to be eliminated, since the development meeting requires the full attention from all participants. Firstly, the location of the meeting should be away from work interruptions and in a place where undisturbed group work is possible. Using cellular phones and computers should be forbidden during the meeting, excluding the use of the innovation management tool where ideas and agreed actions are written at the end of the meeting. The longitudinal research case was

challenging in this respect because the meetings were held in the working environment. Error sources were minimized by dividing the working society into two groups, with the one group running the business, and the other group holding the development meeting without any disturbances.

Organization development may confront sources of errors that are derived from attitudes or from the management culture. These possible problems should be avoided in advance by interviewing the management and some of the leaders. For example, the interviews could include questions on whether the leaders' have authority to decide the development actions taken in their own working group and whether there will be laying-offs or major changes during the development process which could influence attitudes and steal the focus away from the collective development. Naturally problems may occur, for instance, the group foreman may change, or illness may occur that has to be dealt with. In case there is no foreman or leader present in the development meeting, another authorized person who can approve the improvement actions has to be appointed. If the leader is unsure in approving the optimal improvement actions it indicates that the leader does not have a clear understanding of the strategy or his or her position concerning the development of the group. This information is very important from the management point of view when estimating the decision- making hierarchy.

In this research longitudinal case study, some foreman changes occurred that were set in motion by the needs raised up for discussion during the tacit signal development process. The basic approach was to help the leader solve the problems in a way that would not increase the leadership's workload. If the leadership-based problems remain and worsen, one possible solution is to change the leader. As a researcher, my role was to be neutral regarding these decisions, since they were solely the organization's own issues.

Intermediate attitude-based factors were found in the course of the research that had a positive effect and supported the achievement of the target. These factors could be used intentionally to promote success. For example, in the longitudinal case there were times when the managing director happened to visit the development meeting just to say hello and encourage the development that he considered to be important.

These events were found to be very motivating for the participants. In fact, observing this phenomenon had great usefulness in creating the competence system intelligence model, where management can influence the working groups' culture in a positive way.

During the research there was one cross case study showing that management practices may cause an intervening factor for the successful HRD process implementation. In this particular case, the development process went according to the plan until it was discovered that the foremen did not have the authority to make decisions considering the actual development of the group. The chosen optimal development actions for the group had to be approved by the management board, which in practice meant significant delays because managers did not have time to go through the individual group's improvement ideas. This was very stressful for the leaders and frustrating for the employees. After that particular case the authorization chain would always be checked by interviewing the management. If the management board wanted to verify the actions, they had to do so in a very strict schedule. Using an internet-based innovation management tool, this kind of approval procedure can be carried out systematically and without delays.

3 Theoretical HRM and tacit signals framework

3.1 Background for HRM framework

Human resource management (HRM) includes set of policies and practices that are used in organizing work and improving possibilities to achieve the organization objectives through existing human resources. Organization human resources have to be controlled in order to achieve the staff's desired behavior. Stewart (1991) identifies three human resource control strategies: manager directed, bureaucratic and employee-centered control. Manager directed use supervising and monitoring work and guidance using direct instructions. Bureaucratic control is also known as compliance model (Guest 1991) where there are typically fixed tasks, rules and procedures, equitable pay and somewhat restricted flow of information. In employee-centered control there is more emphasis on employee flexibility and creativity, and control is relying on self control and commitment with the use of organization objectives.

HRM researchers indicate that effective HR-management should take care that there are enough skilled employees with adequate motivation and organizational opportunities to participate at organization value creation processes (Appelbaum et al. 2000, Purcell et al. 2003, Boxall and Purcell 2008). This approach is commonly known as AMO theory (ability, motivation and opportunity).

Several research studies reveal that certain HR-practices seem to have positive impacts on the organization's performance and success (e.g Ichniowsly et al. 1997; Guest 1997; Pfeffer 1998, Becker & Huselid 1998; Lau and Ngo 2004). One widely recognized research is Pfeffer (1998) study where seven most important HR-practices are listed:

- employment security
- sophisticated selection
- teamwork and decentralization
- high wages linked to performance
- extensive training
- narrow status differentials
- communication and involvement

Contingency approach at HRM does not seek general best practices that can be used for every organization, but instead tries to find out an explanation on how one attribute or character depends upon another (Vecchio 2000). Every organization has several contingent factors, like structure, size, technology, culture and environment. These situational factors affect to the choices of best fit practices (Hunt 1992).

Human resource-based theory states that organization's human resources are the source of sustained competitive advantage (e.g. Barney 1991). This approach states that the use of certain best HRM practices are relatively easy to imitate, but the real competitive advantage that comes from continuous human capital development is more difficult to copy and thus produce competitive advantage.

Hence it is clear that HRM has essential role in strategy implementation. Complexity, uncertainty and various contingent factors have to be considered at HRM to enhance strategic management. Mueller (1998) identifies organization social architecture and evolutionary human resource competencies development as key elements at strategic human resources management (SHRM). Hamel and Prahalad (1993) emphasize defining and building core competencies that are in line with the strategy and are focusing in the future, rather than preserving the past. It seems that achieving the competitive advantage there have to be good HR-practices and excellent continuous knowledge development and utilization procedures. Boxall and Purcell (2008) argues that there is little point in making a difference between resource-based view and knowledge-based view, because both approaches seem to have same emphasis to create competitive advantage through learning and utilizing human capabilities.

Human resource management connection to performance (HRM-P) has focus in explaining, measuring and managing the HRM link to organization success. Boselie et al. (2005) reviewed 104 articles and identified that the top four HR-practices were: training and development, contingent pay and reward, performance management (e.g. appraisal) and careful recruitment and selection. Guest et al. (2003) studied 366 companies in UK for possible HRM practices causality with performance. The study revealed positive association between HRM and profitability, but also supported the view that profitability may create

scope for more HRM practices rather than vice versa. HRM-P approach seeks explanation why chosen HRM practice improves performance, and if so, to what extent. Becker et al. (2001) argue that 'you must be able to throw back the cover of that black box and reveal a plausible process of value creation from HR to firm performance'.

Indeed there is strong empirical evidence and theoretical basis for believing that emphasizing of systematic HRM will improve employee involvement and enhance organizational performance and productivity (see Beardwell and Claydon 2010). Hall (2004) argues that without the use of theoretical framework and mechanism which mediate HR practices and performance outcomes, the research studies linking HRM to performance have no explanatory power. Fleetwood and Hesketh (2010) argue that there are 'bewildering array of approaches, perspectives, frameworks, typologies, studies, theories, models, maps and accounts, all at various levels of abstraction, generality, universality, particularity, concreteness and micro and macro or orientation', which all lack real explanatory power and solid theoretical foundation.

Human capital, intellectual capital and intangible assets all describe organizational intelligence which is rather difficult to monitor and estimate. The Human capital theory describes the value of the employees' skills, competence, knowledge and experience in producing economic value (Schultz 1961; Becker 1964). Edvinsson and Malone (1997) presented a framework for intellectual capital where both human capital and structural capital were included. Human capital can also refer to the employees' capabilities of solving the customers' problems (Sullivan 1998). These capabilities are based on collective know-how, experience and skills.

Human capital can be described as the capacity of an organization to use resources and capabilities in order to achieve their goals (Ulrich and Brockbank 2005). Furthermore, Ulrich and Brockbank (2005) argue that human resources and organization intelligence produce together the systematic capacity needed to achieve strategic goals. Gratton (2004) explains that human capital is derived from the individuals' and organizations' in the form of three elements: intellectual capital, emotional capital and social capital. Emotional capital is maintained via self-awareness and makes continuous learning and growth possible.

Social capital arises from relationships, which are greatly affected by the organization's structure and hierarchy. Human capital may also be simply the knowledge, skills and competencies of people in the organization (Coppin 2005).

Lövendahl (1997) describes intangible assets as a combination of competencies and relational resources. Competencies consist of individual (knowledge, skills and attitudes) and collective assets (databases, technology, procedures). Relational resources are comprised of reputation, loyalty and relationships. Human capital includes intangible assets that are utilized capabilities. Mankin (2010) defines that the organization's capabilities can also be described as the organization's core competencies. Human capital obtains the possession of organization-specific knowledge that gives the organization the potential to produce competitive advantage and sustain it (Carmeli and Weisberg 2006). Fitz-Enz (2000) describes intellectual capital as an intangible asset that is left at work when the employees leave work, and human capital as the intellectual asset that goes home every night with the employees. Human capital management can be seen as the combination of HRM and HRD: HRM's role is creating and maintaining, whereas HDR's role is involved with improving (McLagan 1989).

Studies on the Finnish economy indicate that investments on intangible assets are nowadays higher than investments on tangible ones (Huovari 2008). Human capital intangible assets' importance on economic growth is discovered to be greater than tangible investments' importance on technology and structures (Huovari 2008). The importance of these investments can be estimated through productivity improvement, which comes from workforce increase and improvement of work productivity. Intangible investments have improved work productivity by approximately 0.9 percent per year during the years 2000 to 2005, which means that about 30 % of labor productivity's growth stems from the deepening of intangible investments (Jalava et al. 2007).

In these studies the intangible investments are assessed using a so-called CHS-method which is created by Corrado, Hulten and Sichel (2005). This method divides intangible investments into three areas: computerized information, scientific and creative property (innovation capital) and economic competencies (intangible assets). This CHS-

method is applied into several studies in developed countries like USA, UK, The Netherlands, Japan and Finland (Haskel and Marrano 2007; Marrano at al. 2007; Fukao et al. 2007; van Rooijen-Horsten et al. 2008; Corrado et al. 2005).

The computerized information asset is increased by investments on software, including databases that are utilized in the organizations. The innovation capital includes investments on R&D, mineral exploration and other innovative property (van Rooijen-Horsten et al. 2008; Huovari 2008). Other innovative property reflects mainly the innovative and artistic content in commercial copyrights, licenses, and designs that are created mainly in the fields of architecture, television and motion pictures, publishing and music business (van Rooijen-Horsten et al. 2008). In the CHS-method, the intangible assets include the organization's knowledge which is embedded in company-specific human and structural resources, including brand names (Corrado et al. 2005). This asset is called economic competencies and it consists of three areas: brand equity, organizational human assets and organization's structural resources. The organization structure includes investments on the organization consulting services and own management time consumption in the development of the organization's structure (van Rooijen-Horsten et al. 2008).

Jalava and Pohjola (2007) estimated in their study that the work quality improvement contributed only 0.14 % unit increase in labor productivity per year in Finland during the period between years1995 to 2005. According to Ylöstalo (2005), the study reveals that in Finland there is a lack of organizations that systematically utilize the new forms of work organization which generate workplace innovations. Additionally, the work organization experienced that the atmosphere at the workplace seem to have been deteriorating during the recent years (from 2003 to 2008), and furthermore the conflicts in work units have increased (Lehto and Sutela 2009). Totterdill et al. (2002) conclude that several studies suggest a positive relationship between new work practices and company-level performance. Indeed, it seems evident that there is a significant possibility of improving the human capital productivity in Finnish organizations.

The economical competencies (intangible assets) are rather difficult to measure. However, recent studies reveal that they should be included in

the economic growth analysis. It seems that the nature of highly developed countries' growing economics have changed in the last decade in such a way that most of the economic value is actually created with intangible assets. Although these human assets embedded within organizations are difficult to measure, they should be included in the economic statistics to yield more information on the growth factors in organizations and the economy. The economic competencies include organizational capabilities of utilizing human capital in value creation. Organizations invest more on internal organization development services and use their employees' working time on knowledge improvement because managers expect these investments to be profitable. However, measuring the economic impact of human resource development interventions is difficult due to a lack of proper evaluation strategies (Hezlett and Gibson 2005).

According to the Finnish working time statistics the average time spent for actual work is around 81% of the theoretical regular yearly working time (Elinkeinoelämän Keskusliitto 2008). Statistics do not separate the time required for orientating new workers or for time spend for workplace development, therefore they are included in the 81%. In a single organization it is possible to get quite accurate data on the distribution of working hours. The time for actual work can be calculated by deducting vacancies, absence and other non-working hours from the total working time. I propose that working time distribution statistics should recognize orientation time and organizational development time. Furthermore, to explain theoretical connection in HRM-P the effective working time and other working time need to be identified.

Labor input capacity grows when the amount of total hours worked increase or if the quality of labour work increases (Bell et al. 2005). Labor is the single most important factor in organization's productivity and therefore measurement of the hours worked is needed for analyzing labor productivity (OECD 2001b). The European Commission's employment report for the year 2002 indicates that better job quality should lead to significantly higher labor productivity.

The study on the quality of Finnish companies indicated that wasted working time was the biggest single reason for quality costs (Andersson et al. 2004). Liukkonen (2008) argues that as lack of motivation weakens the quality, it also causes an increase in both mistakes and costs. This

led to the thought, that if the competencies (indicating the quality of working life) are improved it will derive more time for effective work as other working time decrease.

The other working time includes PAFF classification for quality work (BS6143-2) that is not actual operative work. The abbreviation PAFF comes from the classification of work and expenses into Preventive actions, Appraisal work, handling of internal Failures and external Failures:

a. The cost of preventive actions (Prevention costs)

- Training, guiding, instructing, quality system, preventive maintenance, auditing, cleaning, alarm systems, maintaining order.

b. Appraisal costs

- Checking, testing, measuring, quality control, piloting, sample taking and analyzing.

c. Internal failure costs (Failure)

- Waste, scrap, redoing, fixing, rechecking, defects finding, correction, repairing.

d. External failure costs (Failure)

- Customer reclaims corrections, returned products, guarantee costs.

In most production processes the labor is the most important input factor and therefore should be evaluated more thoroughly. The staff size is not an adequate factor since many workers are working different hours per year. It is possible to calculate the full-time-equivalent (FTE) from the staff accounts by dividing the total working hours with the nominal working hours per year. This FTE is the total labor resource pool and should be used when calculating, for example, the revenue per employee. The quantity of labor can be measured from the hours worked and the labor cost by multiplying the total hours with the average compensation per hour.

However, for HRM-P measurement purposes the total working hours or FTE are not nearly enough. Firstly, the total working hours (paid hours) are different from the hours spent for actual work contribution. Secondly, each employee has a different contribution to the organization's value-adding process. In addition to the physical presence (hours for actual work), the contribution also includes the value of personal

human capital – meaning that one hour's input from one person is not necessarily the same as one hour's input from another (OECD 2001b). In macroeconomics there are several attempts to solve this problem of quality effecting labor input. Jorgenson et al. (1987) have used age, education, class of workers, occupation and gender as characteristics describing the workers' quality contribution. Lavoie and Roy (1998) have used a classification based on skill intensity and occupational distribution of working hours.

Certainly, the hours used for actual work is a significant factor in measuring total capacity and productivity. Measuring only the total actual working time does not take into account the effect of deepening of human capital. Considering the PAFF work quality distribution principle the actual time for work can be divided in effective working time and other working time (PAFF). In this approach the total capacity is achieved in the total effective working time. The problem lies in the measuring of the division between other working time and effective working time. Accurate measurement is not possible in real life, since time follow-up will change the distribution itself because time registration would increase the other working time (Appraisal part in PAFF), furthermore staff may not be precise in reporting the time spent for internal failures (e.g. mistakes, double doing, waiting, interruptions, rumors communication, handling personal issues, searching, transition).

3.2 Theoretical orientation for HRM-P

Scientific approach using empirical research and statistical techniques may give possibilities to show causal correlation with certain HRM-practices and organization performance. Fleetwood and Hesketh (2010) argue that statistical association is not enough; researchers should also try to describe plausible theory to explain why the HRM-practices increase organization performance. They state that "empirical research that is under-theorized lacks explanatory power". In this research a plausible theory is introduced to explain how and why human resource development may increase organization business performance. This

theory gives theoretical HRM-P framework, and it is the foundation for the human capital scenario analyzing (see article 4).

The phenomenon could happen as follows: workers experience developmental needs because they feel that their contribution gets somewhat wasted. HR-development process will help working societies to implement optimal improvements which improve the measured human competencies and improve the quality of working life. These improvements will reduce the other working time (PAFF), thus increasing the share of effective working time. However abovementioned will increase the absolute effective working time only if HRD process is being done effective enough to contribute excess. Increasing effective working time makes it possible to produce more revenue with the same HR costs, leading to improved productivity. The phenomenon is logical and sensible and seems to explain the empirically grounded findings.

The example calculation explains it best of how productivity is derived from human resource competence development. A study of a company that makes 100 M€ revenue and its average human competence on the level of 74% was measured from validated competencies of leadership, team culture and processes. These competencies are validated for company purposes as the most essential human drivers of performance. Company have variable costs 63.385 M€, staff costs 14.277 M€ and other fixed costs 11.767 M€. The example company has 4.4% staff turnover and 0% staff growth.

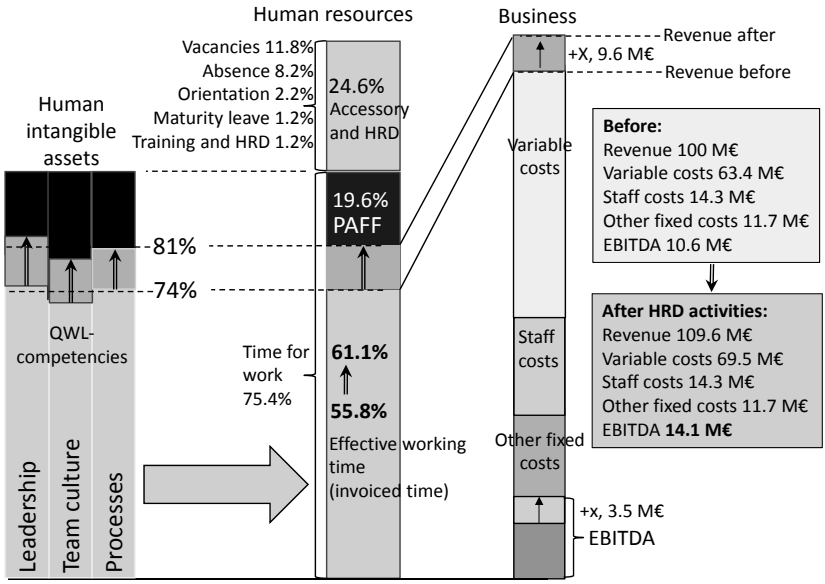


Figure 2. Thesis theoretical HRM-P framework describes human capital intangible assets connection to business performance scorecards.

The company manages to improve its competencies from 74% to 81%. This requires 0.7% effective development time investment for implementing the workplace innovations. To simplify, in this case case the HR-development investment reduces absence and new workers orientation so that Accessory and HRD time consumption remains the same. Two situations are calculated keeping the company's cost structure unchanged, meaning that fixed costs (including HR) remain the same and variable costs depend on the revenue change. Also in this simplified analysis HR-business coefficient (slope) remain unchanged. However, variable costs do change in euro because they are dependent on the revenue (material and other purchase increase with the revenue). With this in mind, it is simple to calculate the meaning of the changed situation for the business in EBITDA (earnings before interests, taxes, depreciation and amortization).

Table 1. Table illustrates an example company's competence improvement's effect on revenue (REV) and gross margin (EBITDA).

		Competence 1 74,0 %	Competence 2 81,0 %	Affect to business	
	Working time and affect	Work time distribution 1	Work time distribution 2	Affect to revenue	Affect to gross margin
Sab	Sickness absence	6,10 %	6,10 %	0	0
Oab	Other absence	1,70 %	1,70 %	0	0
Aab	Accident absence	0,40 %	0,40 %	0	0
Vac	Vacations	11,84 %	11,86 %	-40 289	-14 752
NWO	New worker orientation	2,20 %	1,90 %	532 701	195 048
Ml	Maternity leave	1,20 %	1,20 %	0	0
Lo	Laying offs	0,00 %	0,00 %	0	0
Twt	Travelling at working time	0,00 %	0,00 %	0	0
Tr	Training	0,50 %	0,50 %	0	0
Win	Workplace development	0,50 %	0,70 %	-352 682	-129 134
PAF	Other working time (PAF classification)	19,65 %	14,35 %	9 473 493	3 468 706
EfWT	Effective working time	55,92 %	61,29 %		

Revenue change (€)	9 613 223	9,6 %
Gross margin change (€)	3 519 868	33,3 %
Revenue after the change (€)	109 613 223	
Gross margin after change (€)	14 090 542	

The example company improves its competence with 9.5% (percentual increase) which could likely reduce the percentual amount of sickness and accident based absences, however this affect is neglected from this analysis. As a result the company gained 9.6 M€ more (9.6%) revenue and 3.5 M€ more EBITDA.

In this phenomenon, implementing optimal workplace innovations will improve competencies by releasing hidden powers for removing obstacles that are preventing the effective work, thus increasing the competencies and effective working time.

The theory's phenomenon as mathematical equation would be following:

Time for actual work TfW at the beginning is calculated by

$$TfW1 = 1 - (Sab1 - Oab1 - Aab1 - Vac1 - NWO1 - Ml1 - Lo1 - Twt1 - Tr1 - Win)$$

where working time distribution variables are as in table 1. Effective working time (EfWT1) is calculated by equation

$$EfWT1 = TfW1 * C1$$

and other working time (PAF1) is calculated by equation

$$PAF1 = 1 - EfWT1$$

The same equations are calculated after the tacit signal development process with competence (C2) and workplace development time consumption (Win2) among possible other changes in working time distribution variables. Now it is possible to estimate the revenue change by equation

$$\Delta REV = \left(\frac{REV1}{EfWT1}\right) * EfWT2$$

and gross margin (EBITDA) change by equation

$$\Delta EBITDA = \left(\frac{REV1}{EfWT1}\right) * EfWT - VC2 - SC1 - OFC1$$

where REV1 is revenue at the beginning
VC2 is variable costs for the REV2 (VC2 = VC1/REV1 * REV2)
SC is staff costs
OFC is other fixed costs

Organization's operation capacity and productivity are derived from effective working time. According to the case experience it seems that the tacit signal development process has a tendency to improve the competencies contributing to the organization's productivity and capacity increase. Several cross-studies also indicate a positive effect on job quality as the employees' absence from work statistics has decreased significantly (e.g. Telma 2010). These practical findings are explained by using hermeneutic deduction and mathematical equations forming causal-explanatory HRM-P theory, which is included in the human capital scenario-analyzing tool.

3.3 Theoretical HRM-P falsification tests

According to Popper (1968) and Lee (1989) the scientific theory should survive the actual attempts of its falsification. Therefore the HRM-P theory should also explain why in some cases the organization performance is

not improved, although the HRM succeeded in improving the human competencies. Also the theory should give plausible explanations to why business performance may be improved although human competencies were decreased.

Test 1: Organization implemented a considerable HRD project that affected staff's well-being and competencies by improving them. Also, absences due to sick leave reduced 4% and human competencies improved 4% (percentual changes). Despite these positive outcomes, the productivity decreased. Nevertheless, the business environment was steady.

Plausible explanation: The Accessory and HRD total time consumption exceeded the positive outcomes according the following calculation:

Table 2. Table illustrates the test 1 and its plausible explanation.

	Competence 1 74,0 %	Competence 2 77,0 %	Affect to business	
Working time and affect	**Work time distribution 1**	**Work time distribution 2**	**Affect to revenue**	**Affect to EBITDA**
Sickness absence	6,10 %	6,00 %	178 839	65 482
Other absence	1,70 %	1,50 %	357 677	130 963
Accident absence	0,40 %	0,40 %	0	0
Vacations	11,84 %	11,85 %	-17 193	-6 295
New worker orientation	2,20 %	2,50 %	-544 171	-199 247
Maternity leave	1,20 %	1,70 %	-894 194	-327 408
Laying offs	0,00 %	0,00 %	0	0
Travelling at working time	0,00 %	0,50 %	-894 194	-327 408
Training	0,50 %	1,00 %	-894 194	-327 408
Workplace development	0,50 %	2,50 %	-3 576 774	-1 309 631
Other working time (PAF classification)	19,65 %	16,57 %	5 499 421	2 013 605
Effective working time	55,92 %	55,48 %		
		Revenue change (€)	-784 782	-0,8 %
		EBITDA change (€)	-287 347	-2,7 %
		Revenue after the change (€)	99 215 218	
		EBITDA after change (€)	10 283 328	

The high working time investment on HRD (workplace development and training) consumes HR business capacity almost as much as is gained from effective working time share increase. When these are added to the relatively small increase in travelling, maternity leave and orientation time, the total affect to business scorecards turn negative.

Test 2: Organization competencies decrease 4% (percentual), but business competitiveness improves. Accessories and HDR time consumption remain the same.

Plausible explanation: Positive business branch development and investments made earlier that year on product development on product development make it possible to increase revenue and EBITDA. Thus the HR-business coefficient improves the slope between effective working time and revenue.

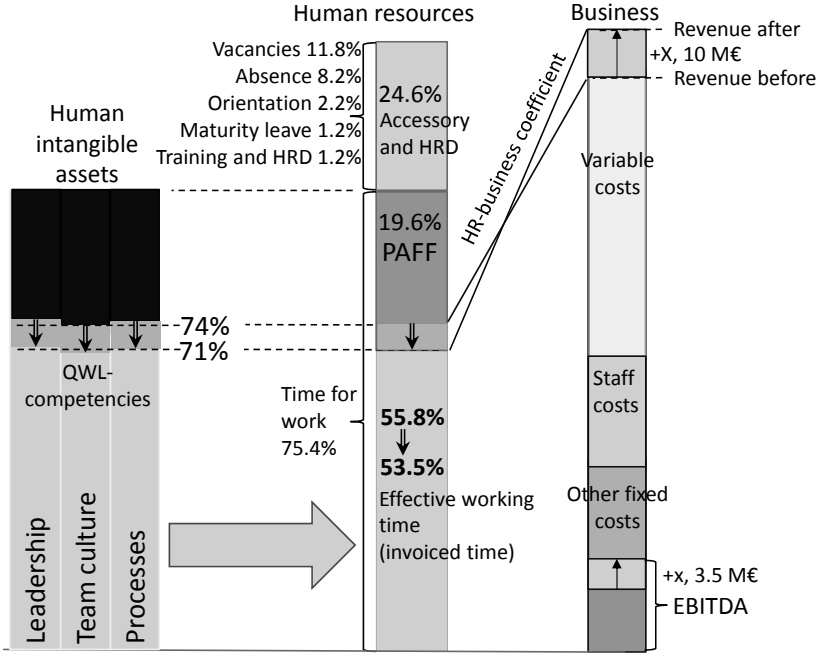


Figure 3. Figure illustrates the test 1 and its plausible explanation.

Figure reveals that business competitiveness would be significantly better if the organization could improve the human competencies. As Porter (1985) state the company should concentrate on chosen basic strategy (low costs, differentiation, segmenting), but at the same time keep the other strategic areas at least adequate level.

3.4 Tacit signal method

Tacit signals refer to personal guiding opinions that can be used in improving human competencies (see Stone 2002; Kesti 2005). In working

societies, the employee guiding opinions help solve problems which is important for the development and is a fundamental element of effective leadership. "The leader who wants to create an emotionally intelligent team can start by helping the team raise its collective self-awareness", says Goleman (2006). It seems that collective emotional intelligence is characteristic of top performing teams (Wheelan 2005). Emotional intelligence helps deal with emotions and thus can be considered ability or a competency (McEnrue and Groves 2006). Boyatzis (1982) defines competence as an underlying characteristic of a person which results in effective and/or superior performance in a job.

The tacit signal method is based on the dichotomy scale, consisting of two interrelated forces (see article 1). When measuring the competence development needs, the optimal performance is achieved when these forces are both optimally utilized and therefore in balance. This approach of two interrelated guiding forces is also visible in Asian philosophy of yin and yang (Xinnong 1999). It seems that the same approach is included in the Yerkes-Dodson's (1908) law of tension-performance relation (inverted U-curve), which is an important basis of human performance and emotional intelligence development (Goleman 2006).

Each person is a bodily and knowledgeable psychophysical being and tied in time and one's own situation of life (Rauhala 1982). According to the Yerkes-Dodson law, each person has their own best performance that corresponds to their personal 100% performance in a relative scale. When using inverted U-scale at tacit signals, the focus is not on measuring absolute competence and comparing it against some fixed scale, but rather measuring situation-based personal development needs and analyzing competence level with relative scale from 0 to 100%.

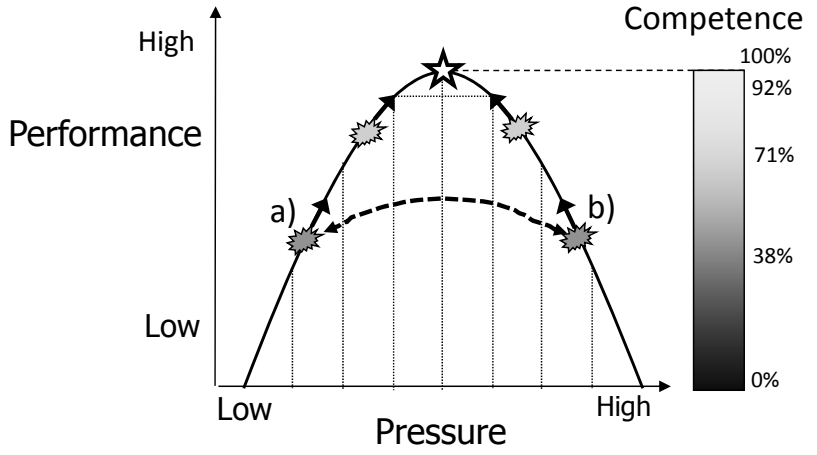


Figure 4. Figure illustrates the principle of inverted U-curve in competence analysis.

In figure 4 the point a) illustrates a person who does not have enough challenges and is frustrated. The person needs more challenges and activities to to increase his or her performance. However, it is essential to proceed in balance to avoid excessive pressure, which could turn the situation to the opposite side of the inverted U-curve, causing anxiety and stress (see figure 4 point b). At the point b) the person is highly stressed under excess challenges. Stress can cause a variety of symptoms; one being forgetfulness and another being that of cynicism, which is destructive for the working community. The situation can be improved by decreasing the stress and enhancing the quality and different aspects of the working milieu and collaboration. This may mean for example arrangements at work distribution within a group in question.

Nonaka (1994) introduced knowledge creation process where shared cognition and collective learning generate organizational knowledge creation. The principle of interrelated and opposing factors affecting organizations is raised also in The Knowledge Creating Company by Nonaka and Takeuchi (1995). They observed that there seems to be a multitude of dichotomies – such as tacit vs. explicit, mind vs. body (or matter), self vs. others – that are affecting organization knowledge

creation. These dichotomies are not different coins, but rather the opposite sides of a coin as they are mutually complementary of one another (Nonaka and Takeuchi 1995).

The tacit signal method can be described by using the inverted U-curve (Yerkes-Dodson's 1908). The situation in the inverted U-curve can be measured by asking the person's opinion about the development need concerning the competence attribute. For example "working community meeting practices" could be one competence attribute in the team culture competence. The person may feel that this competence is not optimally utilized, since there is a need for further development and therefore the opinion is on the right side of the inverted U-curve.

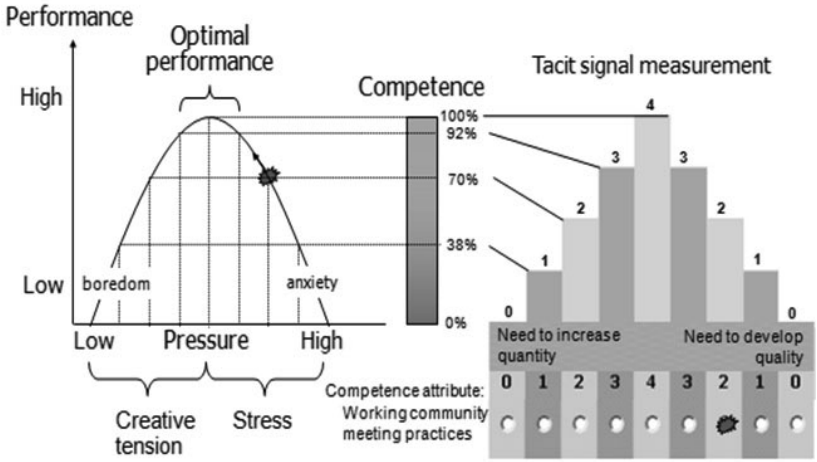


Figure 5. Figure shows the tacit signal inquiry's connection to the inverted U-curve.

The guiding factors are chosen so that they follow the dichotomy principle where one guiding force guides towards more straightforward actions (e.g. quantitative) and the other is more related with emotions (e.g. quantitative), thus guiding towards a constructive dialog between the parties and individuals (see article 1). The tacit signal competence analysis uses the sin-curve following the formula:

$$C = sin\left(\frac{\pi}{8} * x\right) \qquad \text{(formula 1)}$$

where x is the tacit signal inquiry guiding opinion.

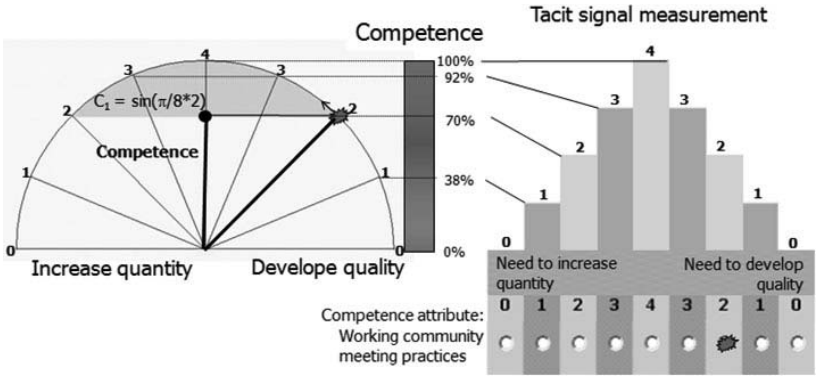


Figure 6. Figure illustrates the tacit signal inquiry analysis principle.

The tacit signal inquiry consists of several competence attributes that are validated as important for the organization, thus supporting the organization's targets. Each person gives their own guiding opinion on the possible development need for each item. There is a possibility to choose only one guiding option. This means that the inquiry serves as a trigger for the tacit signal in retrieving the balance between the dichotomies. Nonaka and Takeuchi (1995) have described this fundamental idea as follows:

> *"Written primarily for the academic reader, our discussion here revolves around our observation that organizational knowledge is created by transcending a multitude dichotomies presented throughout our book. "*

and

> *"We maintain that any adequate theory of knowledge creation must contain elements of both".*

These guiding forces are related to each other, meaning that when the quantity is increased it also affects the quality. Correspondingly, when quality is improved it affects the quantity. For example, in a meeting practices quality development may at first require more time, but when new meeting practices are adopted, it can decrease the consumption of time spent at the meetings.

In addition to the dichotomies mentioned earlier, another important dichotomy needs to be considered; the interaction between the Self and the Other (see e.g. Nonaka & Takeuchi 1995, Senge 2006, Losada & Heaphy 2004). This essential dichotomy in improvement actions needs to be balanced out, in order to achieve organization knowledge development.

Each employee will state their own opinions which are then collected into the working society's collective knowledge base of the necessary development needs. Each employee is reflecting their own self in the group where the development is conducted together in a constructive dialog between others. The tacit signal inquiry is necessary in order to get the balancing feedback for starting the balancing process in the working society (see Senge 2006). Schuler and Jackson (2005) argue that for understanding organization dynamic content a new perspective is needed for 'recognizing the social aspects of human resource management and the process through which organizational members create meaning from complex array of signals'.

High performance organizations prevent possible problems in advance (Mankin 2010, Blanchard and Thacker 2004, Fenwick 2006). This requires an organization culture where certain triggering events are enough to set in motion improvement actions for preventing performance problems. Blanchard and Thacker (2004) point out that a performance problem may or may not actually exist; it is enough that one or more decision makers believe it does. Fenwick (2006) argues that the traditional assumption that an observed problem – such as a task being carried out incorrectly – can be corrected simply by means of training, is flawed. The performance problem – observed or suspected – can be caused due to a wide range of reasons, which are difficult to isolate (Wexley and Latham 2002; Gilley et al. 2002; McClernon 2006).

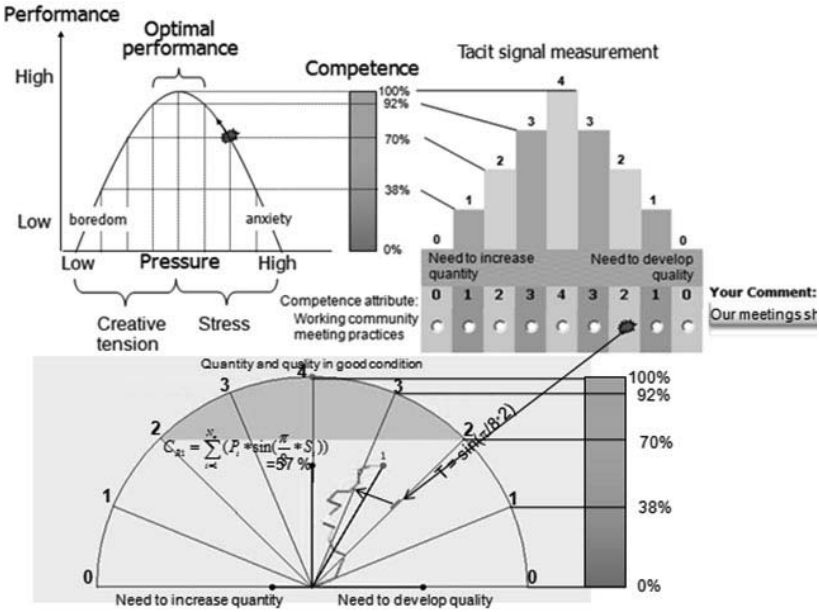


Figure 7. The tacit signal analyzing principle has connection to the inverted U-curve. The 70% competence level is chosen for the alarm zone. This zone illustrates the target level, above which all competence attributes should be.

The tacit signal analysis shows that the group's collective development need is below the chosen alarm level (e.g. 70%), which is the triggering level for competence attribute development. The analysis result in the semicircle depicts the following essential information for development purposes:

1. Competence level and development need
2. The homogeneity or heterogeneity of each opinion compared to others
3. The direction of collective development need

The tacit signal opinions are visualized using vector graphics. In the analysis the measured competencies are shown in a competence semicircular scale. The semicircle radius of the competence development is divided with the number of individual answers. Therefore, in a bigger

group one employee's opinion has less meaning in the group's collective sum of opinions. However, each person's opinions always have the same importance value. Tacit signals are gathered anonymously from each working society. The mathematical formula for balanced total competence for the entire group is illustrated in formula 2 as follows (Kesti 2002):

$$C_{R1} = \sum_{i=1}^{N_x} (P_i * \sin(\frac{\pi}{8} * S_i)) = \sum_{i=1}^{N_x} (P_i * \sin(\alpha)) \qquad \text{(formula 2)}$$

where C = Group competence
P = Group member competence potential
Si = Tacit signal guiding opinion from the inquiry, Si Î (0 … 8)
π/8 = Angle interval in the semicircle opinion scale
α = Angle of the potential segment of a line (0 £ α £ π)
Nx = Number of group member answers

Competencies can be seen as workers' powers to cause actions which may increase the working society's performance (Fleetwood and Hesketh 2010). As the tacit signals help find the development needs, it is possible to agree with the corrective actions towards a desired direction and that way decrease the knowing–doing gap (see Pfeffer and Sutton 2000). Performance improvement should come from performing the right actions based on the information of the organization (e.g. Pfeffer and Sutton 2000; Syväjärvi et al. 2005; Fleetwood and Hesketh 2010). For example, if management knows that the leadership should be improved, they may be able to activate the optimal improvement actions using the tacit signal analysis. The personnel can be involved in the improvement of the working society's competencies and the management can be informed about the needs to support the organization competencies development.

Anonymous tacit signal inquiry provides a method where employees can inform about possible non-compliances without fear of retribution. It is necessary to remind that before the inquiry is launched the competence attributes should be agreed upon with the management and the employee representatives (inquiry validation to organization purposes). Thus, the tacit signal inquiries form a set of competencies that are established as behavioral guidelines for effective business performance and supporting strategy implementation. In this respect the tacit signal inquiry is also an important part of effective corporate governance.

3.5 Tacit signal HRD process and action research

Action research can be seen as a strategy for doing social research (Denscombe 2010). Susman and Evered (1978) point out that action researcher may use different techniques for data collection depending on their professional abilities and research case. This research's longitudinal case study follows the action research strategic guidelines.

Action research brings together action and reflection, theory and practice, in co-operation with stakeholders, aiming to find solutions to the issues concerning participants (Reason & Bradbury 2001). Action research has typically several cycles, forming a spiral of learning and action (Tornhill et al. 2000). McArdle and Reason (2008) outline nine main approaches where action research is applied. In these approaches the tacit signal action research is best positioned at the category of Organizational change and Work Research. The aim is to enhance working groups' performance by improving work practices and human competencies and at research point of view understand the processes of organization change.

It seems that human tacit signals can be connected to the positive management principles and emotional intelligence in social organization context (Syväjärvi & Kesti 2012). Goleman (2006) has studied the emotional intelligence of the working societies and discovered that it seems to be one of the most significant factors affecting group performance. In an intelligent group, members appreciate each other and want to improve the quality of working life with constructive cooperation, thus utilizing emotion intelligence. According to the studies of Losada and Heaphy (2004), the group members' positive feelings increase the work community's performance. When the workers have positive feelings over three times more than negative feelings, the performance of the group seem to increase more strongly. Furthermore, it seems that a group that has good balance between the dichotomies self-group and question-answer are able to create more positive feelings than negative ones (Losada & Heaphy 2004). One important psychological factor is a so-called Pygmalion effect which is also known as the teacher-expectation effect. It has been demonstrated that a group learns up to two times more effectively if the teacher believes in the abilities of the group and in the learning capacity of the individuals in the group (Rosenthal

& Jacobson 1992). To meet these aspects the tacit signal HRD process should enhance positive atmosphere and constructive problems solving at the group.

Hassard and Kelemen (2002) argue that knowledge can be seen as 'a set of cultural practices situated in and inextricably linked to the material and social circumstances in which it is produced and consumed'. When people face new situations, they evaluate the situation and start the sense-making process based on past experiences and knowledge (Weick 1995). Argyris and Schon (1978) identify single and double loop learning where single loop learning could be seen as a process of correcting the fault using past experience, and double loop learning as preventing the fault from happening again by creating new knowledge based on thorough reflection. In the tacit signal action research the aim is not only in solving actual problems, but also in anticipating proactive development to prevent problems in advance.

A social consciousness will be created when members of the group compare their own observations with the observations and ideas made by others (Festinger 1954). Opinions are mostly based on feelings and therefore the interpretation of the group has a great influence on them. The collective social reality of the group directs individuals' opinions, especially concerning the issues that are interpretative and where justifying is challenging. Dialogue is definitely the key factor in knowledge development which has been used since the early days, for example by philosophers such as Socrates, Plato and Aristotle. The group members should have positive mental attitude towards knowledge sharing and possibilities for open constructive discussion. Nonaka and Konno (1998) describe this with the use of knowledge creating concept of BA. Senge (2006) recognizes three critical dimensions of team learning in an organization environment:

1) Team members have the motivation and the ability for insightful thought on complex issues.
2) There is a common need for innovative, coordinated action.
3) There is an ability to share practices and skills between other teams in the organization.

Nonaka and Takeuchi have supplemented Polanyi's (1967) action oriented concept of knowledge by assuming that knowledge is created through the interaction between tacit and explicit, forming four different modes of knowledge conversion. These are (1) socialization from tacit to tacit, (2) externalization from tacit to explicit, (3) combination from explicit to explicit and (4) internalization from explicit to tacit knowledge. In socialization the mental attitudes and skills are shared through social communication where knowledge transfers intuitively. For example, the group can build up the mental thrust toward the notion that problems can be shared, not hidden. In the externalization, the tacit knowledge is transformed into explicit knowledge using words and documented concepts. Typically this requires dialogue and collective reflection. For example, the group can go through feelings and determine the development needs. When knowledge, for example a collectively agreed upon improvement need is explicit, it needs to be combined with existing knowledge and practices. For example, the group can decide on new meeting practices that overcome the old ones and better support the group's needs. Finally, in the internalization mode, the explicit knowledge creates new tacit knowledge, for example when the new meeting practices are implemented and new experiences are formed by learning through doing.

The tacit signal development process has gone through several action research cycles. The latest update recognizes following phases (see also article 3):

> PHASE 1: Management and planning
>
> Development process is planned and organized with the representatives of management, leaders, HR specialists and employees. Targets are set and the important human capabilities as essential competencies are defined and validated for the tacit signal inquiry. Only the competence attributes that are essential for organization strategy and performance management are included.
>
> PHASE 2: The tacit signal collection
>
> Tacit signals are collected from members of each working group in the organization. Results are analyzed by using the tacit signal development semicircle competence analyzing method.

PHASE 3: Strategy development meeting

Strategic HR -development focus is chosen according to the organization's tacit signals.

PHASE 4: Development meetings in working communities

According to the group's tacit signal analysis, each group in the organization agree upon their own optimal improvement actions with follow-up responsibilities and time-schedules. Ideas and improvement actions are written down.

PHASE 5: Follow-up and support

Implementation of actions are followed and supported by managers, leaders and HR specialists. Leadership forums are held where each leader presents their group's improvement actions and possible problems or successes. The Internet-based innovation management tool is used for action follow-up and for sharing the best practices.

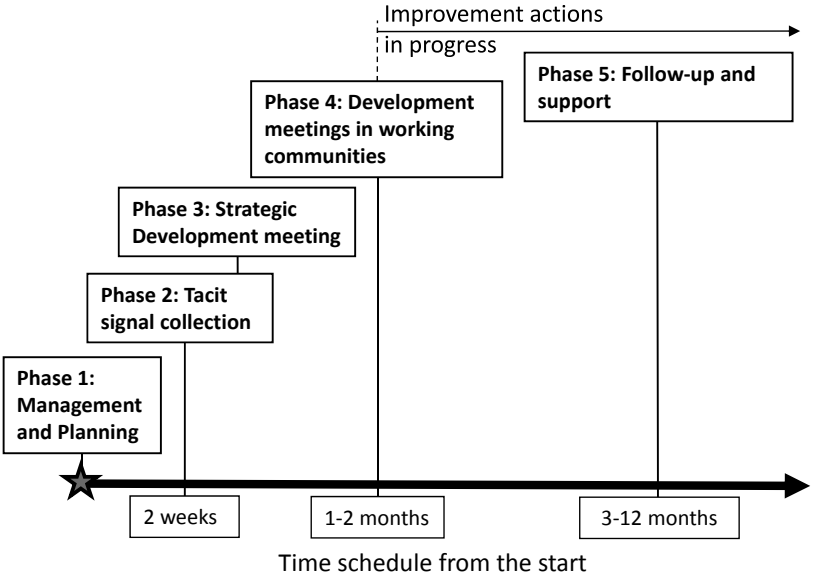


Figure 8. The time schedule for the tacit signal development process.

To make the development process effective for organization performance improvement there are two main factors to optimize. Firstly, the improvement actions should take place as soon as possible, from the beginning of the process onwards. This motivates the participants and the improvement actions are able to affect the organization's performance as soon as possible. Secondly, the time consumption of the participants should be optimized so that the invested time for development gains more benefits than it consumes the organization's capacity to make revenue.

In the tacit signal development process, the aim is that the optimal improvement actions are started in every single working unit within two months from the starting day. Time consumption is optimized so that three hours of participant working time is required for starting the optimal improvement actions and additional 16 hours per person is invested in implementing the selected improvement actions. In total, the process requires 19 hours which is approximately 1% of the average annual theoretical working time of 1900 hours in Finland. In each working group the aim is to implement 4 optimal improvement actions per year. If the average working team size is 8 persons, each optimal improvement action requires an average of (19/4)*8=38 hours, constituting approximately the labor input of one week.

In action research cases the group development meetings were held in similar way. First the leader and the group members are introduced to the tacit signal vector analyzing principle (5 min). After that the group tacit signal results are presented with constructive discussion (15 min). The group agrees the four most essential development needs according the inquiry results. Each development item is discussed and written down in white boards, one per each. The group is then divided into four internal groups with each going to one whiteboard and starting to brainstorm on improvement ideas. After 10 minutes the internal groups rotate, so that each group can continue other group brainstorming. After full rotation each member marks the most important development action idea in each of the four whiteboards. The ideas with the most votes are then discussed and should the leader approve, the ones that are possible to be implemented in the group, will be chosen. The group then has to decide on the schedule of the implementation and the persons in charge. As a result there will be four optimal workplace innovations, which are written

down at innovation management tool for other groups and managers to observe.

The research findings support the conclusion that the tacit signal process strengthens the group's emotional intelligence as the group members learn to solve problems constructively. The subconscious strengthens the operation which is interpreted as inducing pleasure (Dulany 1961). This was noticed empirically in the group members' positively characterized expressions during the group development meetings. This is called verbal strengthening where expressions that receive positive approval from colleagues and especially from the leader, are favored subconsciously. In empirically grounded action case studies, this verbal strengthening in group development meetings is observed empirically.

HRD process has to support strategic human resource management and therefore the tacit signal inquiries have to be validated to organization strategy and language. In empirically grounded case studies, a certain set of preliminary inquiry sets were used as a good basis for validating the one in use in actual HRD process. Some typical preliminary tacit signal inquiries are shown at figure 9.

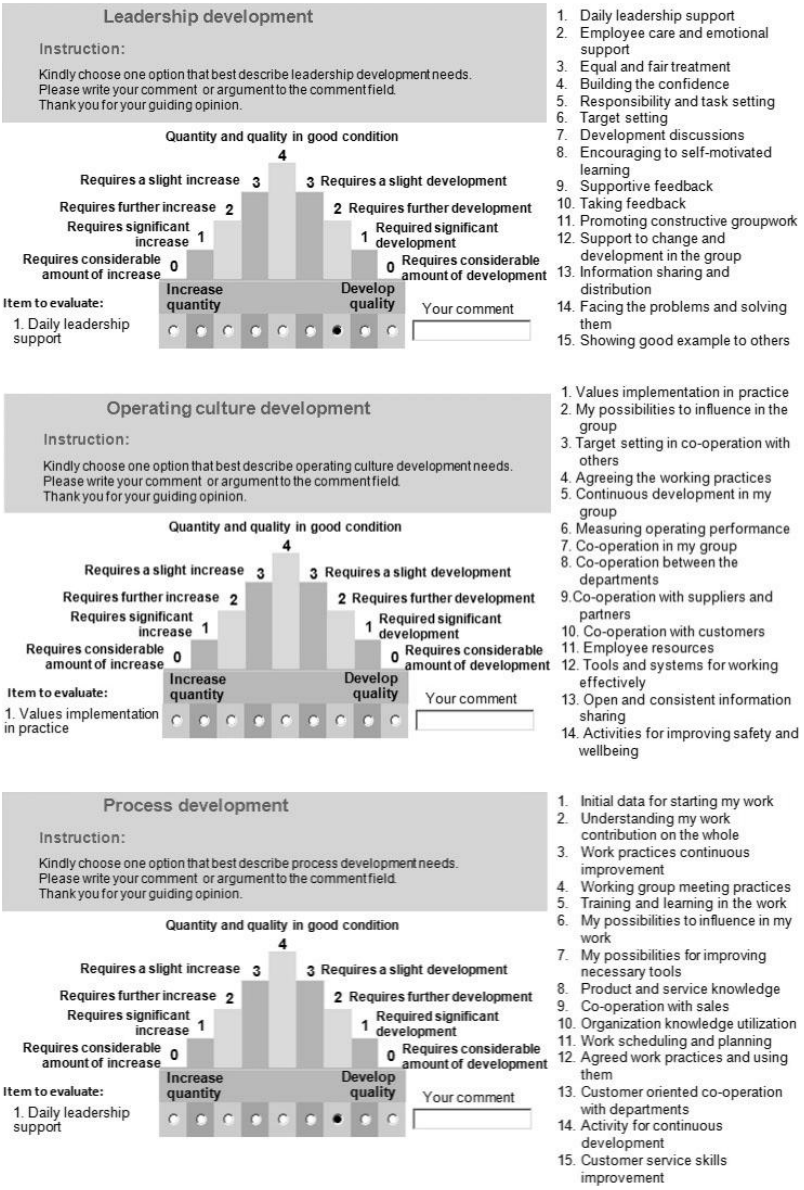


Figure 9. The example of leadership, culture and process tacit signal inquiries.

According to the research findings, it seems that the tacit signal method provides qualitative and quantitative guiding information for improving the competencies. However, the analysis itself does not develop the organization group but only connects it to the HRD process. The collective tacit signal opinions are used at constructive development meeting as a basis for choosing the most important development item. Prior to choosing the development items the group (including the leader) discus the tacit signal results in positive atmosphere.

4 Results of tacit signal HRD action research

The tacit signal development process has gone through the evolution of systematic improvement. Using empirically grounded research, the method was tested and further improved according to action research principles. It was expected at first that using the tacit signal method, the guiding opinions can be measured for decision-making. In the first thesis article, the tacit signal method was studied as eHRM system for competence recognition supporting effective management and organization development (article 1). The tacit signal dichotomy scale seems to support the improvement of decision-making. When essential capabilities can be recognized and improved, they form competencies that should be suitable for learning and growth scorecards, thus forming a part of effective management and corporate government. The tacit signal analysis yields guiding information for improving the measured competencies as described in article 2.

Research studies indicate that the difference between a great and a mediocre team lies in the way they face conflicts and how they succeed in solving them (Argyris 1985; Senge 2006; Goleman 1998). The experience gained from several cases where the tacit signal process was implemented support the Latane and Darley (1969) findings that sensitivity to intervene in the matters which require attention are learned behavior models. Interference with matters that require attention depends a lot on how the members of the group have learned to intervene in them. Therefore, the successful implementation of the tacit signal process itself can be seen as an implemented improvement action, in which the optimal improvement actions are agreed upon collectively. Systematic tacit signal development process seems to create a certain mode of operation that stimulates opportunities for reflection, dialogue, creativity and workplace innovations throughout the organization.

4.1 Organization development leverage phenomenon

The research revealed that in longitudinal case study the leadership and culture competencies seem to correlate most with organization

development and business scorecards (article 2 and 3). When these measured competencies are put in the order of magnitude, a certain leverage phenomenon is apparent. This led to a thought that organization competence development is more complicated than just merely calculating the increase of the arithmetic average. The organization's different working units' competencies seem to vary, so as when shown in order of magnitude a trend line that has high correlation rate is formed. When an organization is developed systematically, the units with lower competence values seem to be able to improve competencies more than those with high competence values. Therefore, the competence leverage phenomenon is formed and recognized especially when units in each round are shown in the order of competence magnitude (see article 3).

Using the data collected from the longitudinal case study, the organization development leverage phenomenon can be observed. When the longitudinal case study's business units are sampled in two sample groups in order of measured competencies, the worst and best units form one sample group (1) and two middle units form another sample group (2). Both of the groups have their average competencies (80%) on the same level, but their competence distribution is different, as seen in figure 10.

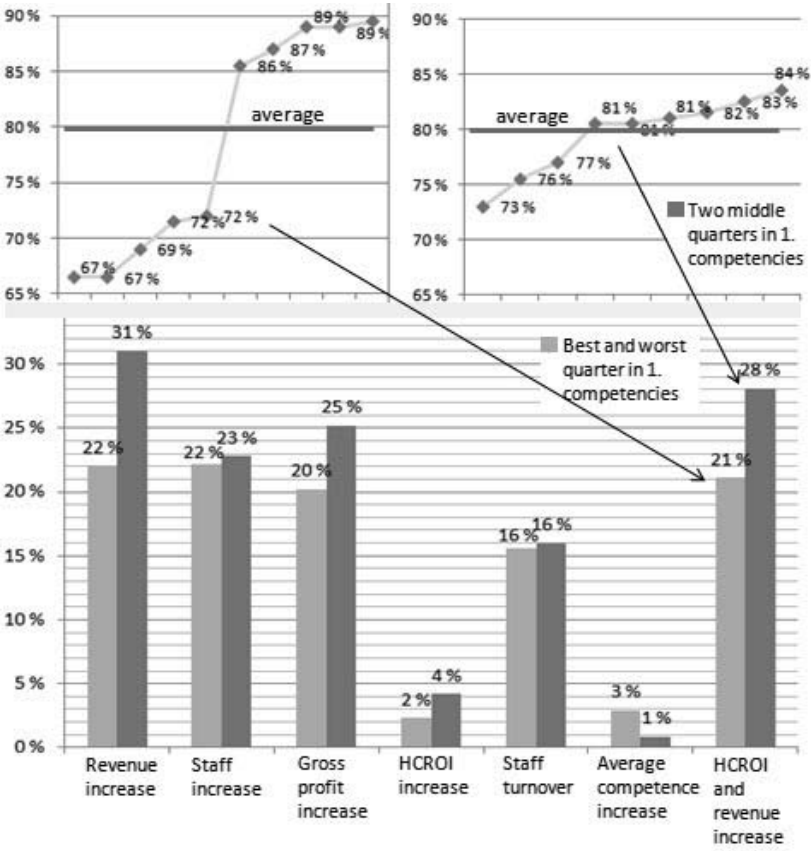


Figure 10. A sample study describing the productivity leverage phenomenon.

It seems that along with the organization units' average competencies, it is also important to study the distribution of the competencies. Greater slope means bigger difference between the "worst" and the "best" working groups in competencies. In this case the business units are separate, indicating that they do not affect the other business unit's performance all that much. This study does not reveal the significance of the leverage phenomenon in an organization where the units contribute value for the same business process – according to the experiences gained from cross-studies the meaning may be significant.

The explanation of the leverage phenomenon can be as follows:

- very high competence means that the working society is not experiencing that much of an urge for development; therefore, they may be able to solve their development needs more proactively.
- medium level of competence means that the group recognizes development needs and is able to solve most of them in a constructive way
- very low competence means that there are conflicts between group members that cause negative defensive mechanisms and hinder the development, thus they need support in their own development.

The competence leverage phenomenon is grounded by findings from longitudinal action case research (see also article 3). Furthermore, the competence development leverage phenomenon can be described using mathematical equations. When the real world events are described mathematically there has to be great simplicity, because only the most significant variables can be included in the equations. However, when the mathematical model seems to show the same phenomena, it produces a certain kind of triangulation of what the most probable factors behind the phenomena are.

According to the case findings the staff increase (and presumably also decrease) and staff turnover seem to decrease the competencies. This is logical because the group agents' (persons) composition changes causing more development needs. Therefore group's structural change is acting towards the tacit signal development process that has a tendency to increase the competencies. Also the competence level at the beginning has an effect on the possibilities to increase the group competencies.

The mathematical description consists of the following variables:

Pn	=	personnel increase (% from total number of staff (FTE))
Pincease	=	personnel that are on a orientation period due to the organization change (% from total number of staff (FTE))
Pturnover	=	personnel turnover (% from total number of staff (FTE))
Cdec	=	competence decrease due to organization staff change (%)
Cdev	=	competence increase through the tacit signal development process (%)
C1	=	measured competence before the development process (%)
Tedev	=	effective development time consumption (% from total working time per year)

First, the Pn is calculated:

$$Pn = \frac{Pincrease}{2} + \frac{Pturnover}{2 * 2}$$

In this equation the personnel training time is estimated to be one year, during which worker's efficiency is half of the average experienced worker's efficiency (see Fitz-Enz 2000). In staff turnover, the assumption is that on average employee leaves, and a new one arrives in the middle of the year.

In the next step, competence decrease from the organization's structural changes is estimated:

$$Cdec = 0.5 * Pn$$

The tacit signal competence analysis uses the sin-curve, thus the competence increase is also determined using the sin-curve:

$$Cdev = sin\left(Tedev * 100 * \frac{\frac{\pi}{2}}{4}\right) * (1 - C1)$$

where (1-C1) represents the competence development potential. In this equation, the effective development time has to correspond with the optimal improvement actions' implementation according to the following equation:

$$Optimal\ work\ innovations\ per\ year = Tedev * 4 * 100$$

For example, if a working society invests 1% of their total working time on effective development, they should be able to achieve 0.01 * 4 *100 = 4 optimal workplace innovations. This hypothesis is studied more later on in the research under the innovation management section. If the measured competence is 70% before the development, the competence after the development is:

$$C1 + Cdev = 70 + sin\left(1\% * 100 * \frac{\frac{\pi}{2}}{4}\right) * (1 - 70\%) = 81{,}48\%$$

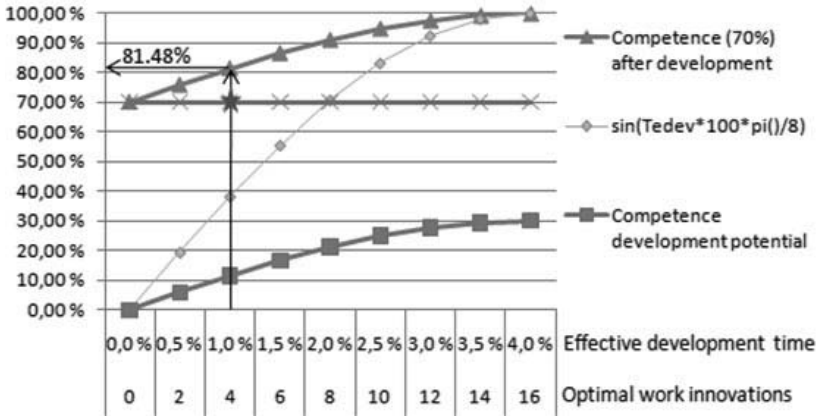


Figure 11. The principle for the competence development calculation.

If the group simultaneously increases their staff with 10% it will cause a 5% decrease, thus the competence will be 81.48% – 5% = 76.48%.

In order to see how these equations describe the longitudinal research case progress, the real life case and the mathematical estimation scenario is compared against each other. The mathematical estimation is based on measured competencies (2005) and uses the staff increase and average turnover of each unit. The effective development time is considered by using a random number between 0.5 and 1.5 which imitates the importance of unknown parameters' influence in reality. In the action research the aim was 1.0% effect on development time (19 hours per employee) and the achievement of four optimal work innovations in each of the working units during a one year period.

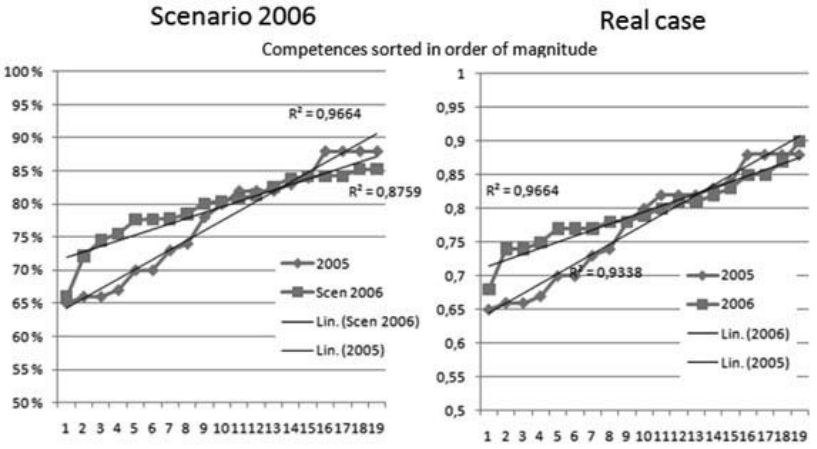


Figure 12. Leadership competence development according to scenario analysis and the real life case.

According to this evidence it seems that these equations provide certain causal-explanation what might happen in the competence leverage phenomenon, following the causal-explanatory method described by Fleetwood and Hesketh (2010). This explanation seems to be consistent and makes sense, thus providing certain triangular verification for the competence leverage theory. These equation principles have been used in the scenario analysis tool (see article 4).

In the leverage phenomenon the competencies on the highest levels are decreasing despite the systematic development activities. Since tacit signal competencies are analyzed through inquiries of the competence development needs, the decrease in competence means that the persons in the group have identified more development needs. This phenomenon, in which the highest competencies are slightly decreasing, seems to be consistent with the observations of Child and Whiting (1949). Child and Whiting discovered that a person who has experienced success is willing to take more risks and try harder to achieve more success. Hence it seems that success feeds success, because the person who has succeeded raises his objective level (detect more development needs). Correspondingly, the experiences of failure decrease the level of future objectives.

4.2 Optimal workplace innovations

Research study indicates that in every working team there are multitude possible improvement ideas for increasing the performance of the working team. When working group improvement idea is successfully implemented, it can be called the workplace innovation. However, if there are several possible improvement ideas, then which are the most essential ones? The reality of working life is that the group cannot execute every improvement idea, thus they should carefully select the ones to be implemented. The definition of optimal workplace innovation was created to illustrate this problem. The hypothesis of this research is that the optimal workplace innovations are those improvements that the group members, with their leader, have themselves selected and implemented as the best possible option for improving the performance of their own working group.

Innovation can be defined as newly implemented knowledge based invention or idea that improves the organization competitiveness and performance (see Porter 2006). Innovations can be radical business, product or technology innovations or they can be incremental (marginal) organization process improvements (see Freeman 1987). Fagerberg et al. (2005) propose that organizing innovations creation there are two main approaches the "J-form" and "adhocracy". Adhocracy (Minzperg 1979) relies on individual specialists' knowledge in generating radical new products and processes, whereas J-form (Aoki 1988) organization relies on knowledge of operative working groups in continuous improvement through incremental innovations. Tacit signal HRD process flourishes the J-form innovation generation.

There is a need for increasing workers' performance through new working practices that nurture the core competencies, such as team skills, communication and problem solving (OECD 2001 b; Totterdill et al. 2002). Several recent economic analyses show that workplace innovations are as important sources of economic growth as technological innovations (see e.g. Corrado et al. 2005; Perez 2002; Sanidas 2005). The Finnish government launched a national innovation strategy in 2008 that aims for better balance between technological and social innovation (including workplace innovation) (Alasoini 2009 b). Niinikoski (2011) study

indicate that work innovations as social innovations have got legitimized and institutionalized status in policy-making since 2007, as work innovations gained eligible status in competitiveness and productivity improvement without the technological content.

The idea is to promote sustainable productivity growth by simultaneously improving organization performance and quality of working life. The quality of working life (QWL) can be described as the well-being of the work community and the individual employees (Efraty & Sirgy 1988, Ramstad 2009). The sustainable productivity growth means organization improvements that will also improve employee well-being (see Holbeche 2006; Huzzard 2003; Docherty et al. 2002).

Hamel (2007) points out three essential management innovation challenges:

1. How to ensure that discomforting information is not ignored or explained away in the organization hierarchy.
2. How to build an innovation management process that continuously generates hundreds of new strategic options.
3. How to accelerate redeployment of resources focus in initiating future possibilities and not sticking to the legacy of the past.

In a high performance organization, innovation is everyone's job as innovations can be described as knowledge-based exploited initiative for improving performance (Hamel 2007).

Ramstad (2009) has studied the Finnish Workplace Development Programme (1996-2005) for workplace innovations and quality of working life linkage to organization performance. The study revealed that the combination of workplace innovations varied from workplace to workplace, depending on their needs and past development. QWL and performance were improved in a variety of development actions that improved practices related to teamwork, leadership, working capacity and coping, pay and benefits, customer service, quality systems, external networking and practices related to ageing workers. The broad employee participation, collaborative orientation and good project management skills predicted best positive outcome (Ramstad 2009).

The success of new working practices is linked to the investment in workforce development. French and Bell (1990) define organization renewal processes and problem solving capacity as follows:

- ability to constantly generate new ideas
- translating new ideas into products and services
- ensuring a widespread distribution of knowledge to employees throughout the organization.

New forms of work organization aim for maximum utilization of human potential in high levels of learning and problem-solving (European Foundation 1997). This is realized by implementing workplace innovations which reflect the interplay between a complex set of both internal and external factors affecting on the organization. It seems that an organization's capacity to survive and grow depends on the capability to adapt to a changing market, customer needs, technological opportunities and business models. These intangible human capabilities require systematic development of organizational competencies, forming a culture and an attitude that promotes the ability to capture and attain the tacit knowledge of all employees.

The idea is to search for 'win – win' solutions, enhancing organizational performance and job satisfaction by developing employee competencies and creative potential in problem solving and innovation (Totterdill et al. 2002). In fact, for creating competitive advantage the utilization of the workers' knowledge, experience and creative capabilities seem to be one of the key performance drivers (see Porter 1985; Prahalad and Hamel 1990). Based on empirically grounded evidence attained from social research, it is clear that there are other factors in addition to financial rewards that determine human work motivation (see Maslow 1943; Herzberg et al. 1959; Antonowsky 1988; Kets de Vries 2001).

However, skepticism has also occurred in respect of existing research linking the human resource management systems with organization performance. Wall and Wood (2005) and Godard (2004) argue that current evidence for a relationship between HRM and performance should be treated with caution and healthy skepticism. Purcell et al. (2009) state that despite extensive effort the goal of establishing clear link between HR practices and performance still remains some way off.

The tacit signal development process aims to create generic HR development process for creating optimal workplace innovations for improving competencies in accordance with group members' collective development needs. In this research the optimal workplace innovations can be seen as knowledge-based work related to competitive advantage that has been collectively selected and utilized as the most optimal situational improvements in the working society (e.g. group or team). Optimal in this case means that from a multitude of development action possibilities, the ones that are most effective for the working society are chosen.

The tacit signal development process can be seen as a process of innovation in accordance with Van de van's (1986) notion: "The process of innovation is defined as the development and implementation of new ideas by people who over time engage in transactions with other within an institutional context". Working societies have the power to generate cooperative working practices and certain HR-practices might act to trigger these human powers (Fleetwood & Hesketh 2010).

Because organization is dynamic in nature the HR development practice should also be dynamic. The tacit signal development process enhances the generating improvement actions in different kind of working groups. If the implemented actions are optimal they should in favorable circumstances increase group performance. Favorable circumstances mean that there are no intervening variables which could prevent the HRD process effectiveness or quality. The idea behind the tacit signal development process is to listen to the group members and help generate optimal improvement actions for each working group separately. The process is both dynamic and generic because it can be replicated to different working groups and the results (workplace innovations) are characteristic for each group.

When examining the tacit signal development process, three different phases can be discovered that are essential for creating optimal workplace innovations to be implemented. First of all there is a strategic planning phase where the performance drivers are identified as competencies. Selected competencies (e.g. leadership, culture and process) are formulated by using competence attributes, usually 10 to 15 attributes per competence area. Next, using the tacit signal inquiry the collective

development needs are identified and analyzed for each group, and four most essential collective development needs are identified. Each group will hold a development meeting where the group invents improvement ideas as possible solutions from which the group selects the most optimal ones for implementation.

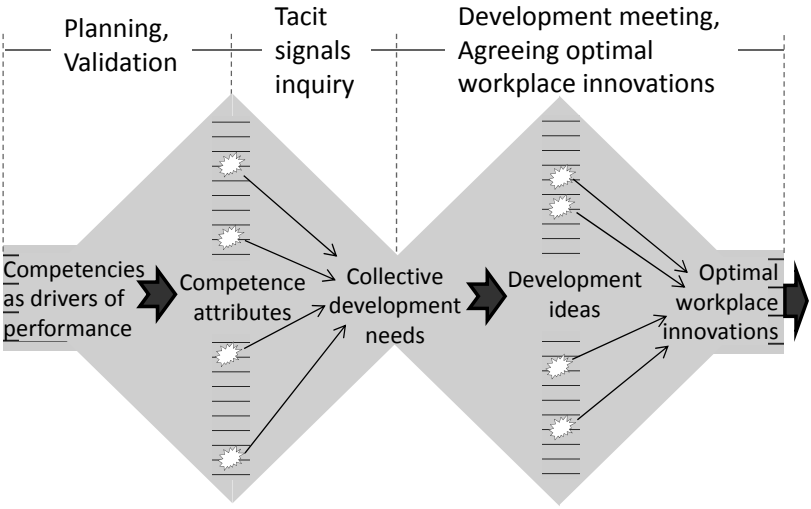


Figure 13. Figure illustrates how optimal workplace innovations are created at tacit signal HRD-process.

Performance improvement is learned through performing the right actions based on the existing knowledge of the organization (Pfeffer and Sutton 2000). Mankin (2010) points out that learning in a "classroom" does not transfer to the workplace automatically – it needs a lot of thought and intervention to be able to utilize new know-how in the organization. Ramstad's (2009) study in the Finnish Workplace Development Programme indicates that new practices are not easily absorbed, but need a systematic development process to grow roots and spread into everyday life. As contingency theory implies, these optimal improvement actions have to come from the group's needs and the circumstances they are in (Hunt 1992; Greenberg and Baron 1995). Various studies indicate that applying several practices in a complementary way is usually more effective in organization development than single practices (Appelbaum

et al. 2000; Pettigrew and Whittington 2003; Kalmi and Kauhanen 2008; Ramstad 2009). The optimal workplace development actions are not only multiform but also situation bound, therefore it is impossible for an outsider to say in advance which actions are the optimal ones for the work community (Greenberg and Baron 1995).

Organization development starts from the management's understanding and commitment on the idea that performance can be improved significantly by utilizing the employees' innovativeness. Several research studies indicate that organizations that are committed to their employees and allow for the tacit knowledge base to increase are the most successful ones in the long term (Collins and Porras 1994; Arie de Geus 1997; Ylöstalo 2005; Liker 2004). Totterdill et al. (2002) points out that the change process itself brings extra costs for companies, which reduce productivity in the early stages. Therefore, the effectiveness in the HR development process is important, as was also noticed earlier at theoretical HRM-P framework.

In this research, the fundamental assumption is that collectively agreed upon improvement actions concerning collective development needs are optimal workplace innovations only when they are supported by whole group including the leader and are implemented successfully. In the case studies, it was observed that each organization working society was able to create several practical improvement ideas. However, their successful implementation was not self-evident but rather a challenging task for many working societies. The innovation management and improvement action support needed consistent and systematic follow-up methods and tools. Therefore, the Innovation management e-HRM tool (InnovationMill e-HRM) was created based on the action research findings. Each group has there their own list of potential ideas and a follow-up blog for chosen improvement actions, as well as a list of implemented best value practices. This InnovationMill e-HRM tool was included at the tacit signal development process at multiple case cross studies after 2008. At the figure 14 there is analysis of the ideas gathered from gross studies (N=7) with total of 575 employees in one year time.

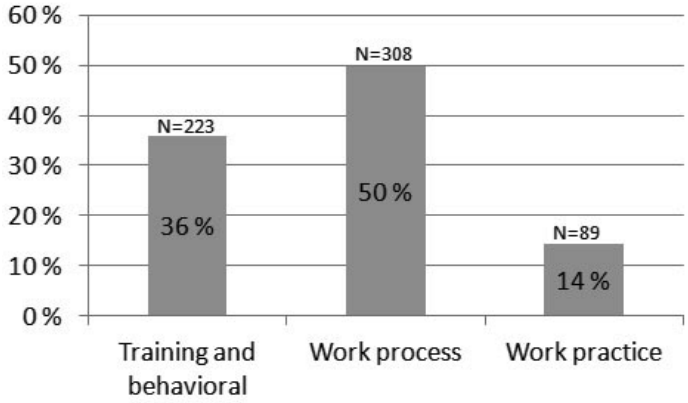


Figure 14. The workplace ideas can be categorized roughly into three classes.

In the group development meeting, ideas and selected improvement actions were listed into the Innovation management tool. The aim was that each group would select four optimal improvement actions for the project type follow-up with an agreed upon time schedule. If the agreed time limit was exceeded, the Innovation management tool would send an alarm to all responsible persons. This way the whole innovation process results could be surveyed from the beginning and the best practices could be shared between the organization teams; which is important for team learning (see e.g. Senge 2006).

The optimal improvement actions vary a great deal between organizations, as well as between the groups inside each organization. Ideas can be divided for example into three categories. If a group expressed needs for behavioral rules, they were all gathered as one action and listed as a development item on the group board.

4.3 Effective human resource development

Human resource development (HRD) is the process of facilitating organizational learning, performance and change through organized interventions, initiatives and management actions, for the purpose of improving organization performance capacity, capability, competitiveness and renewal (Gilley and Maycunich 1998). Organization development

(OD) can be described as a systematic process of improving social processes in the organization system (Mullins 2005). Both organization development and human resource management are aiming to organization performance improvement and they are pluralistic in nature and related to individuals' learning in a social context which forms the organization. It can be argued that when human resource development involves a whole organization, the aim is organization performance development through organization change.

Employee development is one of the most important issues for the future of the organization, but it is also one of the worst managed issues (Fitz-Enz 2000). This problem may be due to the fact that many HR professionals are not active in using data to evaluate HR-development efficiency and its effect on business (Cascio and Boudreay 2008). Experts conducting human resource development (HRD) are seldom business oriented enough to proceed in the development evaluation beyond the behavioral objectives based on the participants' reactions to the training or intervention (Wang and Wilcox 2006). Regardless of the improved information systems, the evaluation can be a very time-consuming exercise and therefore rather unpleasant activity for the HRD practitioners (Mankin 2009). Latest studies also reveal that the HRD investment's impact on business is not properly evaluated and therefore the decision-making process lacks information on improving development actions (Wang and Wilcox 2006; Swansson 2005; Bunch 2007; Kim and Cervero 2007).

There are many reasons why HRD's effectiveness is not evaluated properly from the organization and business point of view. Many HRD practitioners do not have the right mind-set for evaluating business effectiveness and feel they lack the confidence to do so (Wand and Wilcox 2006; Swansson 2005). Studies reveal that the HRD experts may have the motivation for conducting the evaluation, but they lack the support of the managers and the participants, so in a way they are victims of the organizational culture (Kim and Cervero 2007). The problem is a complex one, as the human related issues usually tend to be. Lewis and Thornhill (1994) discovered the link between ineffective organization development evaluation and the reluctance towards change, which was based on the culture of the organization. Too often managers and HRD

experts evaluate only the reactions of the participants. However, research indicates that this has no correlation with performance outcome measures (Swansson and Holton 2001; Laird 2003).

Organization development should be based on the employees' knowledge and therefore it is discovered to be complicated (e.g. Pfeffer and Sutton 2000). However, excellent recommendations for evaluating training and organization learning have been introduced long ago, although they are not implemented in organizations. One of the classical approaches is the Kirkpatrick model from 1959, where four evaluation levels are recommended. Hamblin (1974) added a fifth level to Kirkpatrick's model, the levels are as follows:

1. Reaction
   - Evaluate participants' reactions at the end of the training. Were they happy with the training?
2. Learning
   - Evaluate what the participants learned. Were the learning objectives achieved?
3. Behavior
   - Evaluate the change in behavior in the work. Did the participants change their working behavior based on what was learned?
4. Results
   - Evaluate the effect on the organization. Did the HRD activities have a positive effect on the organization?
5. Ultimate value (Hamblin 1974)
   - Evaluate the ultimate economic value. Did the HRD activities give added value from the economic point of view?

Hamblin suggested that it would be ideal if these levels produced phases that have a causal effect. However, later studies reveal that reaction has no causal effect on learning or on the other levels (Swansson and Holton 2001; Laird 2003; Alliger and Janak 1989). Many times learning is not a pleasant experience, at least when in a hurry. Additionally, the ultimate value in terms of ROI might be negative if the HRD activities are costly and time consuming (e.g. Stoel 2004).

In their study, Totterdill et al. (2002) noticed that the development payback time was usually difficult to measure and exceeded by several

years. Thus, it can be argued that the development effort is a profitable investment. The experiences gained from this research indicate that when the development is done effectively, it is possible in favorable circumstances to gain measurable payback time that is relatively short, less than one year. This evidence seems to be possible in both companies and in municipal organizations; although more case data is needed to verify this. The cross-studies of the tacit signal development process from four municipal working units showed calculated total return on investment of 4.4 times within one year. This was based on monitored working time of the staff and on the calculations of the effective working time increase. The external costs and the costs for the time consumption of the staff's development were reduced from the value of effective working time increase. Although this case was conducted with only 150 employees in four different kinds of groups, it is nevertheless an encouraging result. In that particular case the staff productivity reward system was used; a collective reward was received when the working group could verify successful implementation of agreed upon three optimal workplace innovations.

Preskill and Russ-Eft (2003) identified five critical issues on which HRD experts need to focus:

1. The need to show effectiveness in HRD
2. The need to describe the process and outcomes of the HRD
3. The need to assess more than just the trainees' reactions
4. The need to be more strategically focused
5. The need to know how money is being spent on HRD.

Efficiency is a general term in economic activity and it describes a value created by sacrifices (Saari 2006). Thereby, improving efficiency is done either by creating the same value by minimizing the sacrifices or by increasing the value with the same sacrifices. Productivity and profitability are specified concepts of efficiency. Saari (2000) points out that efficiency improvement should include both quantity and quality, meaning that efficiency may improve by creating better quality with the same output and input quantity.

It seems that in steady business and HR environment the tacit signal development process is a profitable investment that will probably gain

positive results in the business scorecards (see article 3). In all the case studies, the development process was planned so that the staff will spend 1% (19 hours) of their total working time on the development. About 3 hours is used on the systematic tacit signal development process phases 1 to 4 so that optimal improvement actions can be started. Afterwards the team will use an additional 16 hours to implement the agreed upon actions in practice. In case studies that were carried out under the Finnish Workplace Development program (TYKES), the company was required to monitor time consumption of the development, and the realization corresponded with the planned time consumption.

In the multiple cross case studies (N=9) where Innovation management tool was used there were approximately 103 persons per company or business unit, divided into average five groups of 21 persons. Each organization carried out approximately 16 improvements successfully at the development process duration of 12 months. The typical team implemented 3 improvement actions, among which the successfully carried out tacit signal process is included as one action. Most of the teams (47.7%) carried out 1 to 2 improvements and 38.6% of the teams succeeded in 3 to 4 actions and 13.6% implemented more than 4 optimal workplace innovations.

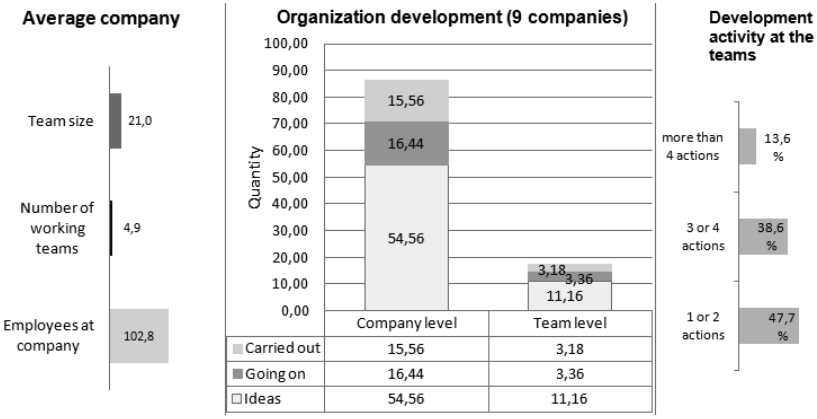


Figure 15. Figure shows the average company or business unit development in cases where Innovation management tool is used.

It seems that the tacit signal development process works in a quite similar way in all organizations, which indicates that it is not dependable on the business branch. In the longitudinal research case units the number of successful actions was higher than in the other multiple case studies, which can be due to the fact that it was already repeated three times over and the teams had gotten used to the process and learned how to improve their working units in this HRD process.

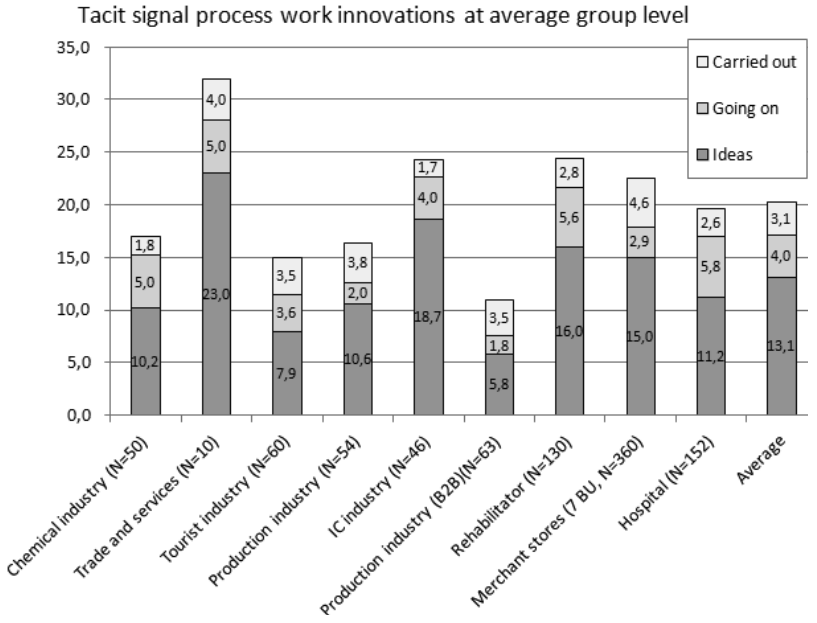


Figure 16. Case studies where tacit signal HRD-process workplace innovations are monitored using Innovation management tool.

A phenomenon of effective development time consumption's correlation with competence improvement and optimal improvement action's implementation (workplace innovations) was created in order to be able to analyze the HRD-process meaning to the human capital productivity. As mentioned earlier, the mathematical formula of competence increase follows a sin-curve against the effective development time.

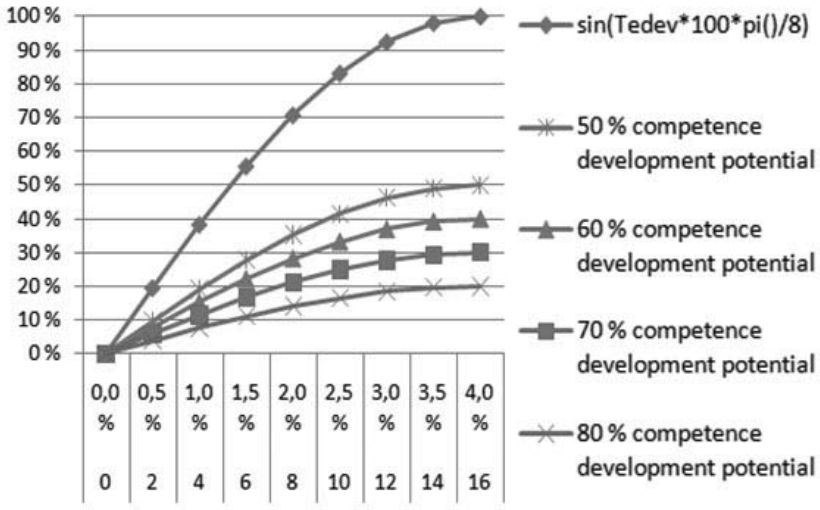


Figure 17. Figure illustrates the effective development time-% and quantity of group's working life innovations (both at x-axis) correlation with competence increase in the nominal case (no organization structural changes).

The effective development time seems to correspond with the number of workplace innovations. However it must be stated that due to the complexity of this phenomenon, there should be more action research case studies to learn more about it.

4.4 Effective working time productivity correlation phenomena

Lönnqvist (2007) studied eleven business branch companies' (micro-enterprises not included) investments on intellectual capital (IC) and its correlation to productivity. The study, based on business scorecards from the year 2001 to 2003, discovered that relationship between IC investments and productivity are negative on a short range, but seem to be turning positive later on. It appears that in the entire case sample, the investments in IC do not correlate clearly with the efficiency of IC. It

appears that in general the IC investments are not effective for improving productivity. Lönnqvist suggests further research studies to be conducted in individual organizations using action research to indentify components of intellectual capital and productivity.

Daveri and Maliranta (2007) made the observation in their case studies that personnel training will contribute to higher productivity after two years' time. In this research's longitudinal case study, the effect of the development process was observed during two years of action research. If competence improvement correlates with better business performance the research data should indicate the correlation. Competencies are the average values of leadership and culture, as was showed also in article 3. In the whole sample of 19 business units, the competence improvement correlation with average HCROI and revenue growth was 0.59 indicating a somewhat considerable correlation. It should be noticed that this correlation is greater than the staff increase that had correlation of 0.46.

Table 3. Table depicts Pearson's correlations for the chosen variables (strong correlation ≥ 0.8, considerable 0.6≤r<0.8, some 0.3 ≤r<0.6 and meaningless < 0.3).

	Competences 1	Competences 2	Competences 3	Revenue increase	Staff increase	Gross profit increase	HCROI increase	Staff transfer	Av. comp. incr.	HCROI and revenue change
Competences 1	**1,00**	0,41	0,43	0,37	0,37	0,24	0,13	-0,36	**-0,69**	0,25
Competences 2		**1,00**	**0,84**	0,45	0,08	0,34	0,21	**-0,84**	0,25	0,43
Competences 3			**1,00**	**0,64**	0,30	0,44	0,32	**-0,76**	0,35	**0,59**
Revenue increase				**1,00**	0,47	**0,85**	**0,61**	-0,35	0,24	**0,98**
Staff increase					**1,00**	0,41	0,12	-0,08	-0,16	0,46
Gross profit increase						**1,00**	**0,87**	-0,24	0,10	**0,93**
HCROI increase							**1,00**	-0,16	0,14	**0,73**
Staff transfer								**1,00**	-0,25	-0,32
Av. comp.incr.									**1,00**	0,20
Average HCROI and revenue change										**1,00**
HCROI av.										

It is assumed that the units (N=10) that have increased their competencies should increase business scorecards more than those (N=9) that have not succeeded in improving their competencies. The figure 18 illustrates that higher competence increase sample group (N=10) seems to correlate with business improvement. The data at the figure shows that staff increase is nearly the same in both sorting under examination. Although the better

half has increased revenue 10.9% (33.5%–22.6%) more than what the staff increases. This means that the revenue increase does not come solely from increased number of staff but presumably from competencies increase (9.3%) as well. It appears that competencies increase would explain the additional revenue growth. Furthermore, the lower sample group revenue was 4.2% less than (18.2%–22.4%) staff increase, the competence decrease appears to be in line with this outcome ((84.1–78.8)/84.1 = 6.3%). These action research findings are in proportion to the theoretical HRM-P orientation that was introduced earlier.

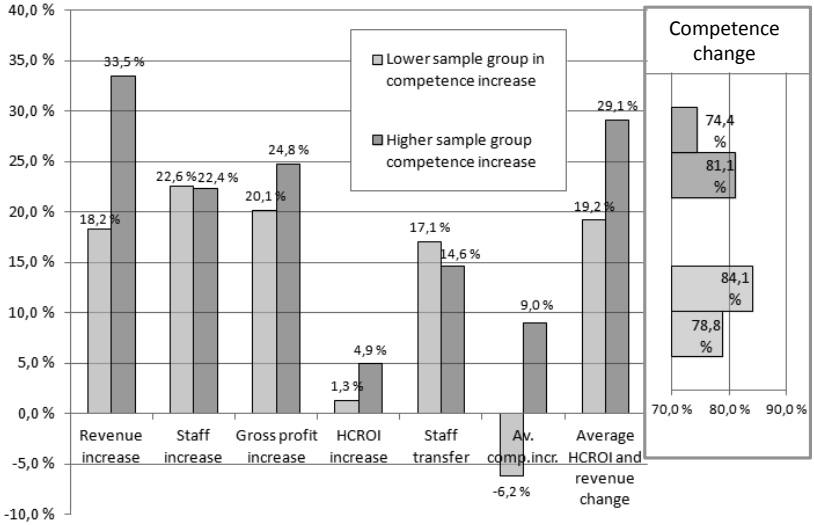


Figure 18. Competence improvement correlation to business improvement in two chosen sample groups.

It is logical that the staff increase reduces the HCROI since the new staff tends to cause more costs than gain profits. It has been argued that highly educated workers need as long as two years of orientation to be able to increase the productivity of a company (Maliranta & Asplund 2007). In the above sample analysis, it appears that the groups that are able to increase competencies can also improve the HCROI despite the moderate staff increase. This may be due to that those working societies are able to train new workers more effectively. It looks as if additional research is

needed for examining the competencies and their development's effect on new workers' effective job orientation and training.

When analyzing only the selected higher half with Pearson's correlations, a clear increase in the correlations is observed. In the higher half, in a competence improvement sample of 10 business units the competence improvement correlation with the average HCROI and revenue change (business performance) was 0.78 indicating a very considerable correlation. In this sample group, also the competence improvement's correlation with business performance is higher than staff increase (0.66).

Table 4. Table describes Pearson's correlations for the chosen variables (strong correlation ≥ 0.8, considerable 0.6≤ r< 0.8, some 0.3≤ r< 0.6, meaningless < 0. 3).

	Competences 1	Competences 2	Competences 3	Revenue increase	Staff increase	Gross profit increase	HCROI increase	Staff transfer	Average HCROI and revenue change
Competences 1	**1,00**	**0,62**	**0,79**	**0,83**	**0,73**	**0,68**	0,38	-0,55	**0,79**
Competences 2		**1,00**	**0,87**	0,58	0,37	0,55	0,35	**-0,92**	0,58
Competences 3			**1,00**	**0,78**	0,55	**0,74**	0,52	**-0,78**	**0,78**
Revenue increase				**1,00**	**0,70**	**0,92**	**0,67**	-0,53	**0,99**
Staff increase					**1,00**	0,56	0,19	-0,29	**0,66**
Gross profit increase						**1,00**	**0,88**	-0,44	**0,97**
HCROI increase							**1,00**	-0,27	**0,75**
Staff transfer								**1,00**	-0,51
Average HCROI and revenue change									**1,00**

It seems that the business units that are able to improve competencies can show a better business performance increase. The Ducatel and Burgelman (1999) study shows that development of new work practices based on employee participation create higher skilled jobs which tend to be more rewarding. It can be argued that this forms a positive cycle where better quality of work raises motivation and yields better business performance. The average business unit competencies (leadership and culture) and performance scorecards increase is demonstrated in the following figure where the average means that values are shown with standard deviation.

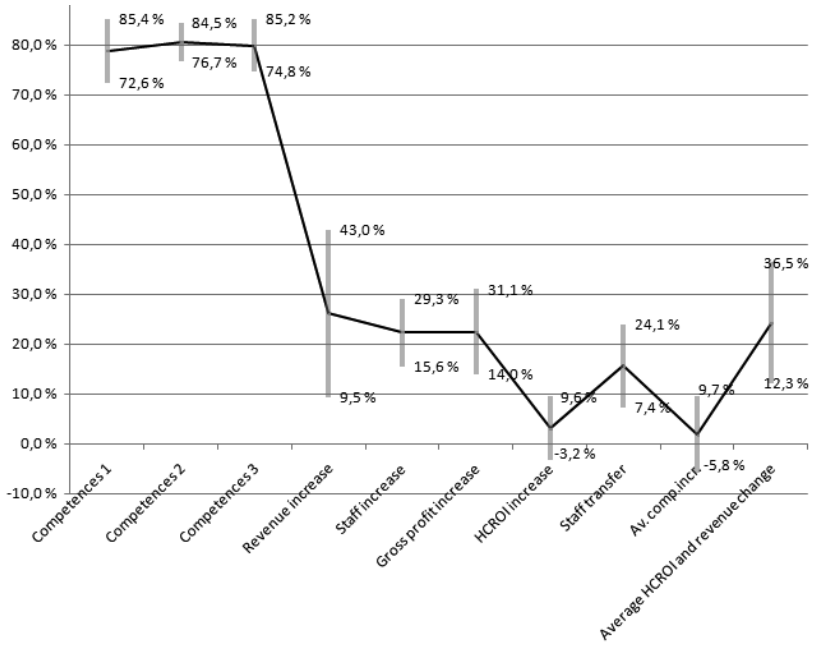


Figure 19. Average business unit key variables with standard deviation.

These action research results should be understood as case specific findings. The business case was intrinsically interesting for scientific point of view. Action research was carried out during steady economical growth where no major intervening variables occurred. The case company, as most of the same size Finnish companies, has adopted the general HRM practices for employment security, sophisticated selection, teamwork, payment linked to performance, extensive training, identified work roles, personnel appraisals and systematic communication and involvement practices. Therefore it would be interesting to learn whether these research findings could be suggestive in general for medium and large organizations that have gained certain maturity in their HRM practices and are operating at steady growing business branch.

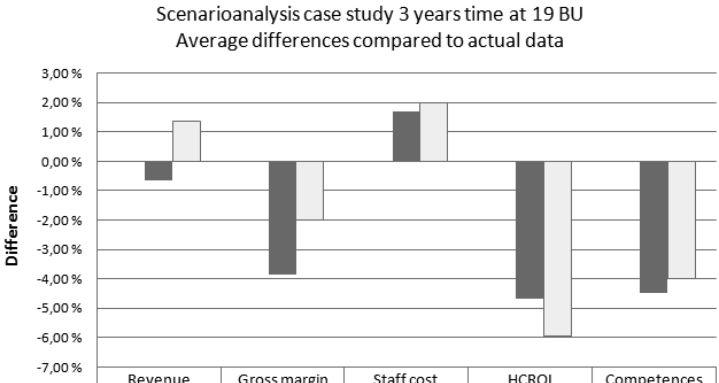
4.5 Human capital scenario-analyzing tool

According to action research findings the human capital scenario -calculation tool was created in order to test the theoretical HRM-P framework (see article 4). The tool includes the structural capital of the human resource and HRD (tacit signal process and training) impact on the organization business performance. The analysis has been used in the human resource risk analysis and business strategy analysis in business organizations. Usually two scenarios are conducted as illustrating the effect of continuous human capital development for management's decision-making. One of the scenarios is the 'business as usual'-scenario or 'low road', where identified risks in human resources are realized without any additional development interventions. The second scenario is the active HR-development scenario, where the same risks are realized, but with additional HR-development interventions ('high road' scenario).

Totterdill et al. (2002) talk about the importance of taking the 'high road' approach in management, in which performance is improved through employee involvement and high quality of working life. Their study is based on an overview and analysis of more than 100 case studies in six European countries: Denmark, Ireland, Italy, The Netherlands, Sweden and UK. The traditionally taken approach is the 'low road', which is based on the top – down way of thinking, where new practices are first planned by the managers and then executed by the staff. In the 'low road' approach, productivity is generally increased by relatively short term cost cutting. Whereas, in the 'high road' approach the productivity is increased by better quality and efficiency that is derived from bottom – up, utilizing the tacit knowledge of the staff. In their study, Totterdill et al. (2002) estimate that by using the 'high road' approach, productivity's increase range will be between 3 to 30%. (Totterdill et al. 2002). It would be essential to reliably identify this information as a great business possibility, in order for it to be used in supporting the management's decision-making concerning investments on organization development.

The principles of scenario analysis (see article 4) were created from the longitudinal business case in a steady growing economy. Although there are plenty of possible and significant sources for errors, the scenario

analysis seems to give enough reliability for management decision-making.



	Revenue difference	Gross margin difference	Staff cost difference	HCROI difference	Competences difference
Actual	0	0	0	0	0
■Scenario Company level	-0.6%	-3.9%	-1.7%	-4.7%	-4.5%
□BU scenarios average	1.3%	-2.0%	2.0%	-6.0%	-4.0%

Figure 20. Figure depicts scenario analysis match for realization of three year's period. The scenarios are made afterwards to examine how they match with the realized variables.

The scenario calculation principles are based on considered and justified assumptions. The development of scenario-analyzing tool represents emancipating action research where the need is arisen to create a technical tool for deepening scientific knowledge, as well as need to increase the organization management's understanding of their organization and its development (see Zuber-Skerrit 1996). Jack Welch argues that corporate administration should pay as much attention to human resource management and development as they pay on financial management (Welch 2005). By utilizing organization intelligence the many crises could be totally avoided or at least recovered faster.

Considering the principles and practical use of scenario analysis, more theoretical and practical findings for further research are expected that were possible to include in this dissertation study. Same scenario analyzing principles should also be applicable for municipal organizations. Virtanen and Stenvall (2010) point out that in municipal organization

management should be able to see the connection between chosen strategy and available resources to be able to consider and prevent possible risks. To encourage future research, it can be noted that theoretical saturation in human capital scenario analysis is not yet achieved (see Straus 1987).

4.6 Competence system intelligence model

During the research the empirical case studies indicated that competencies are situational and changing as organization internal and external environment changes. Furthermore, organization competencies seem to be connected to complex human system where competencies are affecting to each other. For example, management may prevent leader's possibilities to decide improvement actions, which causes frustration among the workers. To enhance organization learning, the competencies relation to each other should be recognized. To illustrate the complexity of organization's human resources development, a competence system intelligence model was created. It includes the competencies of management, leadership, operation culture, skills and process, which were considered to be the most important drivers of organization performance.

According to Schein (1985), one of the most important tasks of the management is to support the culture in which work communities are able to develop continuously and to react positively to constant changes within the business. However, it is common that leaders do not get adequate and truthful information about the problems in the organization's operations (Goleman et al. 2002). It is also evident that even when the management is aware of what should be done to improve the organization's performance they usually have difficulties translating that knowledge into practical improvements. Pfeffer and Sutton describe the phenomenon as an existing knowing-doing-gap which may lead to wrong decisions and thus prevent the optimal development of the organization (Pfeffer and Sutton 2000).

The organization is constructed of the people who work together in order to achieve objectives. Goleman et al. (2002) points out that only the group that wants to, and is able to operate together can be more

efficient and more innovative than the individuals on their own. Thus, even if the organization consisted of strong individuals it can still be weak as a system. Each organization group forms a sort of a micro cosmos in which defensive reasoning and other routines that are used to explain the problems are embedded (Senge 2006). "Defensive routines are so diverse and so commonplace, they usually go unnoticed", describes Senge. Senge (2006) and Argyris (1985) point out that defensive routines are harmful because they tend to block the necessary development. Senge (2006) explains that: "*In general, balancing loops are more difficult to see than reinforcing loops because it often looks like nothing is happening.*" (Senge 2006)

Development process based on the tacit signals helps to define the multitude of defensive routines that make the organization development so difficult. In the action research case studies, several obstacles were noticed to be hindering organization development in practice. For example, several cases were found where the management's cultural obstacles prevented team level improvements because the foremen had no real power to decide on the improvement actions.

Teams may have adapted to the situation and therefore matters requiring developing will not have been brought to light. At the tacit signal development process there seems to be no problems in finding and agreeing upon the improvement actions at the team level. However, the organization sometimes encounters obstacles in supporting the team to carry out these actions. Harisalo (2011) point out that organization innovativeness is hindered if the obstacles are bigger than the creativity supporting drivers. Therefore organization should recognize the obstacles and remove those that prevent the creativity and innovativeness (Harisalo 2011).

The hermeneutic organization system intelligence model was created through research experiences for explaining the complex dynamic nature of organization (see article 3). It explains how organization behavior influences competencies which are interdependent of each other. Dooley et al. (2004) argue that competencies establish the behavioral requirements needed to be successful in a given profession or task. Blanchard and Thacker (2004) describe that competencies are relatively general in nature so they are applicable to different jobs and hierarchical levels, and

that they are adaptive to changing demands. According to Özcelig and Ferman (2006), competencies are focused on the organization's goals and they incorporate feelings and emotions.

The organization is a complex system consisting of organizational human success factors which can be identified as the competencies of the organization. The model of the organization's system intelligence is based on the following competencies and their interactions (see article 3):

- Management
- Leadership
- Group (team) Culture
- Skills (know-how)
- Processes

The management determines the vision and strategy of the organization and provides the necessary conditions for the development of the organization. The management is responsible for the organization structure's suitability for the situation and the staff's abilities adequate balance with strategic objectives. Leaders or foremen organize the operative work and the responsibilities of the workers, and should support the working society's development as a group. Operation culture refers in this context to the internal operation culture of a team or a group, which form the whole organization operation culture. This can be best described with the word solidarity. In the work community, everyone can experience appreciation, emphasized to distribute information and know-how among others. When conflicts are identified and solved together they can be seen as the source of positive energy at the working society. Indeed at every organization there should be certain amount of conflicts which are necessary for the working society development (Vuori 2005).

The know-how includes explicit and tacit skills for conducting the operative work. The processes in question are the work practices that consist of approaches and methods applied to the work and that produce value for the customers (internal or external). Management should get high quality information on company processes for their decision-making to be able to invest in the most optimal operative improvement actions (see Collins 2001, Shigeru Mizuno and Yoji Akao 1994).

System intelligence competencies are interrelated and mutually interactive. In the positive spiral, management supports the leadership and has an effect on the culture. The leadership builds the culture and has an effect on the personal know-how (skills). Shared culture within the team speeds up the skill improvement and affects the processes. Good personal know-how helps to describe effective processes and provides initiative for the management. From effective processes, the management receives high quality information for decision-making, and the clear processes help leadership.

For example, it was discovered that in the longitudinal action research case the know-how itself was not hindering performance, but instead the co-operation in utilizing existing knowledge. Furthermore, in some organizations the process development is forced too much in cases where development focus should be in leadership development. The research indicated that the system intelligence model should have both positive and negative interrelated competence connections. Fleetwood and Hesketh (2010) describe the complex phenomenon as follows: "Depending upon the nature of the interaction with social structures and mechanisms these human powers may remain unaffected, remain unexercised, become actualized, become modified in the sense that power is enhanced, or retarded. Powers in this sense might refer to the people-organization relationships that generate a tendency towards improved (or otherwise) performance. This complex configuration of structures and mechanisms, human and non-human powers, generates tendencies to increase organizational performance, and counter-tendencies to decrease performance."

At competence system intelligence model the negative spiral could happen like this: the management does not support the leadership, and neglecting leadership support has a negative influence on the team culture. Poor co-operation within the team does not support knowledge sharing and its effect on the processes. If the know-how is not shared but instead protected, the defensive mechanism hinders innovativeness which would be important for the processes and the management. If processes are not in order, the management does not receive high quality information for their decision-making. Furthermore, unclear processes

cause mistakes and chaos and have a negative impact on the leadership, which often gets blamed.

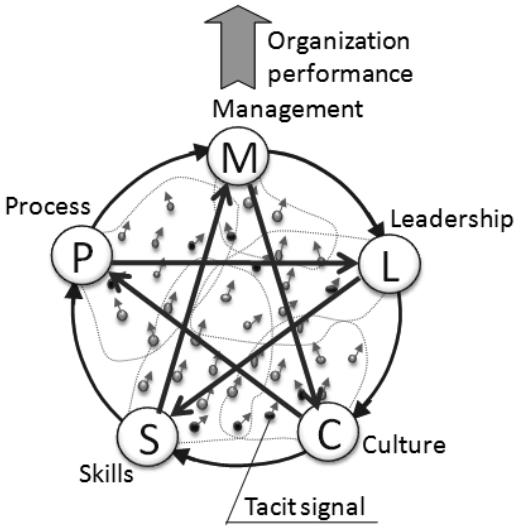


Figure 21. The system intelligence model illustrates connections for the five system intelligence competencies, forming positive spiral and interactions that can be either positive or negative.

Studies in several action research study cases support the competence system intelligence model's practical benefits in understanding the phenomenon of defensive routines and behavioral actions which otherwise would be difficult to see. As an example of this, the tacit signal development process was carried out in a manufacturing SME company. The staff provided several written comments which supported the tacit signal competence analysis. As an example, the following comments were given:

- The managing director has too much management responsibilities over every department.
- There is no clear line in the management.
- For some, the tasks and titles are not in accordance with what is required.
- The independent deciding power of some departments is too small, the chief level person has not been appointed. Sometimes this lowers the

motivation as the foreman's attitude is:"I'm not doing it, because it's not my task".

- More courage for the investments is needed.
- Do the foremen lead the workers or the opposite way around?
- We have strong individuals at work, whose work dare not be commented on. The counteractions can be so strong that improvement ideas are rather left unsaid, when there is possible conflict ahead.
- When there has not been a development discussion, there are no personal development plans either.

Using the system intelligence model, the negative behavior interactions can be described as follows:

The managing director takes too many responsibilities over the departments. However, the manager does not have enough time to consider work level operative matters and listen to the workers or department foremen. The workers have tried to communicate the problems to their foremen, who are frustrated because they feel they have no power to do improvements. The foremen's main task is to organize work. They do not have clear authority of employee or work development. The workers do not want to cause problems, so they neglect the improvement needs. The workplace culture activates strong persons into taking more power than what is appropriate. When decisions are not based on collective needs the overall commitment is not optimal. The motivation to strive for improvement reduces gradually. Because roles within the leadership are not clear, the development discussions are not taken care of and therefore skill development decreases. When restricted and unsupported, the staff's know-how does not yield new ideas, which makes management more difficult. It would be better to choose the best ideas from a pool of ideas, rather than having an empty well.

The system intelligence model provides a method for identifying the probable human related risks so that management can communicate the optimal actions for mitigating the risks. Therefore, the system intelligence model can be linked to corporate governance procedures for HR risk management and HRM processes for HR business performance improvement.

In the longitudinal business case, positive system intelligence interactions were discovered when the managing director showed interest in the team development by coming to the development meeting to greet people. It was easily observed that this kind of behavior from the management seemed to have a positive effect on the team members' motivation for developing improvement actions.

The system intelligence theory was preliminarily tested with practical cases and found useful in understanding the complex organization system, and in seeing the development challenges especially from the management point of view. However, it is clear that this organization system intelligence model should be studied further.

5 Articles findings and results

5.1 Article I main results

The first article presents tacit signal method and concept for international science forum. It introduces the tacit signal e-HRM tool for performing inquiries and tacit signal competence analysis by providing guiding information for organization competence development. Different kinds of inquiries such as job satisfaction and inquiries of well-being have been used widely in order to yield information on the attitudes of the organization's staff. In this respect the several types of staff opinion inquiries and analyses already exist. These inquiries are usually based on Likert's (1932) scale and statistical data analysis. Although these measurements provide reliable information on the attitudes, there are very few cases where these inquiries have been successfully utilized in the organization development. It seems that Likert's scale of well-being and job satisfaction inquiries brings up the problems but does not help the organization in solving them (Liukkonen 2008; Elo et al. 2010). These inquiries measure the staff's opinion concerning the organization's situation but do not guide to effective development, whereas tacit signal method collects employees' development needs using scale of guiding forces for helping to identify optimal improvement actions.

The tacit signal method has new features that classify it as a new or a significantly improved innovation. The tacit signal method deviates from traditional staff inquiries with the following characteristics:

- it measures the development needs
- measurement scale has a dichotomy scale with improvement guiding forces
- the result is analyzed using a qualitative vector analysis in order to show the collective opinion and the lineament of individual opinions, as well as quantified data about the collective competence
- the method is in line with and appreciative of the recognized scientific research concerning organization development (e.g. Senge 1990, Argyris 1985), performance improvement (e.g. Yerkes and Dodson 1908,

Goleman 1998) and tacit knowledge development (e.g. Polanyi 1967; Nonaka and Takeuchi 1995)

The article illustrates how the tacit signal method differs from the traditional Likert scale organization inquiries. Using tacit signals it seems possible to utilize the organization's tacit knowledge for organization development purposes. However, tacit signals are only the key to organization development; the systematic development process is needed for utilizing tacit signal method.

5.2 Article II main results

The second article describes the tacit signal based organization development process as a systematic way for organization development. This article was done during the second cycle in the longitudinal research case with first findings of possible competence improvement correlation with business performance. It demonstrates how tacit signals are used at human competence recognition and development.

The article introduces HCROI index (human capital return on investment) as one essential business scorecard for human resource performance. In this article it was noticed that in the depicted case organization, the leadership and group culture had most development needs and also their development seemed to correlate most with the human resources productivity (or performance) improvement (HCROI), whereas management information sharing and core skills competencies did not indicate so much development needs and correlation with performance increase.

The first empirical findings and data indicated that competencies could be improved using tacit signal development process and there may be correlation with competencies improvement and HCROI. Also it was noticed that staff growth may be one important intervening variable affecting contradictory to the human performance (competencies and HCROI). Indeed the empirical and other data confirmed that high staff increase (and other staff changes) makes competence development more challenging, and therefore the tacit signal development process had to be

improved and more information gathered relating to the human related variables.

The research case findings are in line with the studies of Totterdill et al. (2002) and Ramstad (2009) which indicate that effective organization change requires widespread involvement and participation across the whole workforce. This illustrates that effective organization development should involve all of the staff. Without effective development methods, tools and processes this widespread development could be messy and so time consuming that its added value may be difficult to see.

5.3 Article III main results

The third article was first presented at international TIIM (Technology, Innovation and Industrial Management) conference at 2009 where it was awarded as Best-Paper Award. The article introduces the key findings from the longitudinal action research after the third cycle. The information gathered from empirical research and scientific literature evolved the model for organization system intelligence model. Article explains the organization human complexity by heuristic concept consisting of competencies (management, leadership, group culture, skills and process) and their relation to each other. The competence system intelligence model describes how the organization members' behavior affects competencies and their interdependency with each other. The findings in article III are consistent with those of article II, providing additional information from the longitudinal research case and grounding the tacit signal development process as an effective and systematic way of implementing workplace innovations.

Organization competence improvement seems to be the function derived from the initial competencies, effective organization development, and the magnitude of organization structural change. The essential core competencies of the organization's working society in the longitudinal case study seem to be leadership and culture. When these group's average competence values were set in order of magnitude, they formed a line in which a slope may have important meaning for the organization productivity development. Case findings indicate that

systematic organization development will reduce the slope which in turn tends to improve the organization's capability to improve its business performance. So, the organization productivity leverage model was created and introduced at international science forum. Article points out that when measuring organization competencies, attention should be paid not only on the average values but also on the distribution of competencies in different working groups.

The article describes some additional information in the tacit signal method. The tacit signal competence vector is presented as the source of power that may be actualized better by lining it towards the target. Also the article shows how the tacit signal method is in line with inverted U-curve that is known by human performance-pressure curve. Article illustrates in detail the tacit signal competence analysis principles and also the connection to competence system intelligence model. Management, leadership, group culture and process competence attributes are opened as an example for possible essential performance drivers.

The article includes empirical case findings of competence leverage phenomenon, illustrating that in normal conditions roughly 20% percent of organization groups succeed in developing their workplace rather well and 80 % are not succeeding that good. Furthermore it seems that organizations normally misuse most of their development activities so that roughly 80 % of that time is wasted by arguments and not succeeding to implement agreed change, whereas only 20% of that time is spend successfully for doing improvement actions for solving problems. When both of these, so called organization development obstacle Pareto Rules apply, the organization can not improve human capital performance. In the article the systematic tacit signal development process is described in detail, and it seemed to provide effective HRD practice to overcome these development obstacles.

The article presents the longitudinal research case data and some key findings when data is preliminarily analyzed. It was discovered in the article that the tacit signal development process improved lower level competencies more than high competencies. Those business units that had higher competencies could improve performance more and also their staff turnover was less than those with lower level competencies. It was also evident that organization changes seem to have a tendency to decrease competencies.

The third article strengthens the observation that was noticed in the second article, that high competencies seem to correlate with organization performance and competencies can be improved by systematic tacit signal development process. The article describes a finding where systematic tacit signal development process took approximately three hours of the staff's time when agreeing about the optimal workplace innovations. It also took another additional 16 hours for executing the improvements. Hence, all this considered, it means that circa 1 percent of the theoretical working time was consumed per year for each employee for actualizing the collectively agreed four improvements (workplace innovations).

In this third article certain cause and effect relations were seen between competencies and organization performance. However cause and effect relation does not explain why this happens, thus more scientific studies and critical realism approach were needed to establish the theoretical link, if possible.

5.4 Article IV main results

In the fourth article the key findings and phenomenon are combined as rules for calculating the human capital scenarios. One key phenomenon in effective organization development is the assumption that effective development time consumption will contribute certain amount of successfully implemented optimal improvement actions.

The article describes the complexity of organization human capital (tangible and intangible assets) meaning for organization business. The scenario analyzing main HRM-P theory (see article fig. 6) is described in detail at this meta-analysis. However the organization is open system which makes predictive analyzing rather difficult. The absolute accuracy is impossible to achieve but the article indicates that adequacy for management's decision making should be possible. Scenario analysis is not intended for forecasting the future, but a process for thinking and communicating about the future (Grant 2010).

Multiple human resources and business variables are included into the scenario analyzing that was developed based on the longitudinal case data findings during this research. The article describes some additional test

experiences from municipal and industrial company. Those test results indicate that human capital scenario analyzing is promising and could give managers adequate estimation about the business performance improvement possibilities enhanced from human resources management and development.

5.5 Conclusive synthesis

Fleetwood and Hesketh (2010) argue that new methods are needed to understand how human factors could be utilized better for organization performance development. The principle of the tacit signal measurement seems to be in line with Senge's argument that each person possesses "personal power" that should be aligned with that of the other members of the team in order to optimize team performance. Senge (1990) also explains that when only personal power is increased without alignment, the team will be driven to chaos. These causal personal powers can be seen as competencies that certain HR-practices might actualize; generating high value adding behaviors (see Fleetwood and Hesketh (2010). Using the tacit signal concept which was described in article 1, it should be possible to measure and describe the human competencies in mathematical and visual forms.

The tacit signal development process, described in articles 2 and 3, seems to be effective HRD-process for organization development since the input-output is optimized in a way that enhance collectively agreed upon optimal workplace innovations to be implemented with minimum time consumption (effective workplace development). This systematic development process actualizes competencies for creating workplace innovations. Succeeding in implementing these high value-adding innovations should in certain conditions increase competencies and business performance. However it has to be noted that this needs favorable conditions since organization is complex system with multiple error sources and intervening variables that can complicate the development or prevent the business benefits.

Articles 2 and 3 present the action research findings along with the longitudinal case. In the article 3, the empirical research findings state

that there seems to be essential competencies (management, leadership, team culture, skills and processes) that affect to each other and thus have also certain powers over organization performance. Therefore competence based system intelligence model was created for describing the phenomenon of interacting human competencies at organization system (article 3). The system intelligence model is introduced in this dissertation to illustrate human complexity in organization and for contributing to obvious future needs for research in this particular area.

The research's theoretical HRM-P orientation and case studies indicate that workplace innovations should be created and implemented effectively and HRD-process should extend to the whole organization to be able to generate better business performance. In the longitudinal study, the tacit signal development process was repeated yearly to achieve systematic organization HRD. Empirical findings seem to support the understanding that systematic workplace development guides the attitudes of the employees and the working society in order to continuously improve their performance.

Järvinen and Järvinen (2004) point out that the researcher should be careful of which factors are assumed to be causes and which ones effects. In this research the measured competencies illustrate the staff opinion on the working group development needs. The competencies are the drivers of performance which should correlate with business performance, as assumed at thesis theoretical HRM-P framework. Boudreau and Ramstad (1999) point out that measurement framework is needed for developing theoretical logic to support the inference that investments on human resource strategies lead to organizational success.

The research results indicate that initially the group implements the optimal workplace innovations, which will then improve the competencies. If the optimal improvement actions are conducted effectively there will be improvement in the actual effective working time. In this case, the workplace innovations will improve the human competencies and business performance almost simultaneously, but triggering event for this is the HRD process. This is in line with the understanding that collectively agreed upon improvements (workplace innovations) can be linked to the organization's collective knowledge sharing, well-being at work, values and beliefs and organization performance which are characteristic of

competence management and thus corporate governance (e.g. Syväjärvi 2005; Cameron and Quinn 2006; Kets de Vries 2006; Harisalo and Miettinen 2010).

In the article 3, the longitudinal case study analysis indicates that after three years systematic organization development (OD) the firm increased staff 6 percent more than average business branch. The human capital productivity (HCROI) increase was 9 percent better and sales margin 12 percent better than in average business branch. The performance measurement is more reliable if the follow-up period is for example three or five years (Lumijärvi 2009). Cameron (1982) and Kanter and Brinkerhoff (1981) emphasize that taking care of the sustainability and achieving the targets are both important issues when estimating the effectiveness and performance. The case organization was able to increase human competencies at the same time as they achieved the growth targets (revenue and staff growth). Thus, the conclusion – supported comprehensively by the case evidence – is that the organization was able to improve its performance.

It seems that the tacit signal development process works in a quite similar way in different case organizations. The phenomenon could happen, as follows: group members experience development needs because they feel that there are obstacles preventing their contribution. Tacit signal development process will help them to identify these development needs and implement optimal improvements as workplace innovations. These improvements will ease the obstacles and actualize the personal powers (human competencies) for value-added work and innovativeness. Harisalo (2011) point out that organization innovativeness is hindered if the obstacles are bigger than the creativity supporting drivers. If the development is done enough effectively there will be excess in effective working time. Increasing effective working time makes it possible to produce more revenue with the same cost construction, leading to improved productivity. The phenomenon is logical and sensible and seems to explain the empirically grounded findings. To test this logic the theoretical mathematical model was created for estimating human competence based organization performance development's effect to business scorecards (article 4).

Vuori (2005) points out that well managed human resource system combines fiscal and human performance processes so that they support each other. The human capital scenario analysis combines the findings and HRM-P theory into a mathematical form explaining the phenomenon that encourages improvement in the organization's human capital performance which is achieved through effective development. There seems to be promising logical consistency between the explanation (theory) and action research findings of this study.

6 Discussion

In order to utilize organization performance improvement's potential the management should be able to make a transition from simply measuring performance to actually managing performance, and to have a methodology in place for affecting strategic change (Beardwell and Clayton 2010). Armstrong and Baron (1998) point out that performance management should be a process rather than an event, and it should operate in a continuous cycle.

It seems that in Finnish organizations there are significant possibilities to improve performance through utilizing staff knowledge in developing intangible assets. However, from the business performance improvement's point of view it is essential that human resource development is done effectively so that there will be excess in the effective working time. Furthermore, the intangible assets, human labor resources and business situation, need to be analyzed together to explain or predict human resource development's effect on business performance.

Human competences can be seen as human powers that can be utilized at organization performance development (see Senge 1990; Fleetwood & Hesketh 2010). There is a need for increasing performance through new working practices that nurture the core competencies such as team skills, communication and problem solving (OECD 2001 b; Totterdill et al. 2002). Essential competencies can be analyzed by tacit signal method, giving new information for recognizing human aspects (see Schuler and Jackson 2005) and utilizing the results at balancing process, which is necessary for the organization development (Senge 1990). Furthermore it seems that effective organization change requires widespread involvement and participation across the whole workforce (Totterdill et al. 2002; Ramstad 2009).

The human relations approach tends to assume that good job satisfaction leads to better performance (Mullins 2005). However, there are also references arguing that it is rather the other way round; better performance leads to job satisfaction (see Porter and Lawler 1968). This study supports both views. The systematic human capital development needs to be a strategic long term development; otherwise the organization's cultural chance is not achieved. Long term development is possible when

organization financial situation is in order. If organization is suffering from cost cutting mode the positive human capital development is difficult to achieve. Also the study indicates that structural changes tend to decrease competencies and effective working time. Furthermore, HRM-P phenomenon shows that if job satisfaction is improved with too great an effort there will not be excess business value, however the job satisfaction may be improved.

Epistemological research using critical realism principles (see Fleetwood and Hesketh 2010) in this research indicate that the tacit signal development process can be generalizable in certain circumstances. In those organizations that are in steady market and already applied general best HR-practices can benefit from tacit signal process in creating optimal workplace innovations effectively, thus generating better performance. Ontologically it is essential to describe what does optimal workplace innovation and effective HR-development mean. As a synthesis of this research the optimal workplace innovation is collectively agreed and successfully fulfilled improvement that best fit for the collective development needs identified in the working society. In the organization's human capital performance development the HRD effectiveness means that organization will have value added payback from the HRD investment. Totterdill et al. (2002) points out that the effectiveness in the HR development process is important since the change process itself brings extra costs for companies.

The tacit signal development process generates optimal workplace innovations that will improve performance because it increases the effective working time share from total working time. Thus performance increase will be logical cause if the organization produces its' value (revenue) through employee labor. This phenomenon should be generalizable for many organizations, including most of the municipal organizations. There is a reasonable amount of evidence to say that tacit signal development process is effective when utilized supplementary with other HRM practices, giving value at the difficult area of organization's human intangible assets development.

As an additional contribution to the science the research raises several issues that obviously need further discussions and research. The research was discovered to be more challenging and pluralistic in nature than what was anticipated at the beginning.

6.1 HRIS embedded in HRM

Organization process can be seen as the sequence of actions through which a specific task is performed (Grant 2010). Human resource information systems (HRIS) help performing specific tasks that are related to human resources management and development. HRIS improves HR processes efficiency and multiplication throughout organization. However, HRIS may also prevent from renewing processes and practices when IC technology update is too costly or time consuming.

HRIS has an important role in making intangible human assets visible and manageable. In high competition it is essential that best practices are shared horizontally in the organization. When only one leader knows some of the best practices, it cannot be an organizational asset and thus the benefits are not multiplied. HRIS embedded in HRM has an important role because it makes possible to adapt and replicate the best practices around the organization.

According to the thesis theoretical HRM-P orientation, the organization can increase effective working time by decreasing wasted labour time through implementing effective human resource development. In this study, HRIS tools were used in tacit signals measurement and in workplace innovations management. The HRIS embedded to HRD was essential for achieving the efficiency that was required for performance improvement. Indeed, action research with integrated HRIS development was one of the main drivers for achieving positive results in human capital performance improvement.

6.2 Future trends and needs

There seems to be significant possibilities to improve companies' competitive advantages through management that promotes the quality of working life and encourages workplace innovations – ultimately bringing forth better business performance and profitability. This 'high road' approach for utilizing the organization's intelligence potential as a source of organization performance improvement appreciates communication with employees so that their tacit knowledge can be utilized more

efficiently. Organizations have longer traditions for managing strategic innovations and product innovations; however workplace innovations are not so well utilized. Latter innovation group is more difficult to manage and therefore may form a competitive advantage. Workplace innovations are incremental small improvements that will improve work quality and productivity. The scenario analysis helps identifying these possibilities that can be achieved through effective HRD.

Although this research includes case studies conducted in several Finnish organizations there is still a need for further evidence from organizations with a different cultural background. The characteristic of Finnish organizations is a highly educated staff with strong unions, job protection and good HRM practices.

The organization development based on workplace innovations has been under examination in some of the European countries for example in Finland, Ireland, Germany, Sweden and Norway (see Alasoini 2009 a). Although the organization cultures are different between European and Asian countries there is an increase of interest towards workplace innovations among the older Asian tigers, for example South Korea and Singapore (see Alasoini 2009b). It is difficult to say whether the tacit signal development process with high employee participation is suitable for organizations outside of Finland. However, there is an encouraging experience of a cross-study conducted in a Finnish company's manufacturing facility situated in Estonia which supports the opinion that the management culture determines whether the tacit signal development process is successful. This means that staff opinion in workplace development should be highly valued in the management culture and there should be adequate autonomy of the working group and its leader to determine the most optimal workplace innovations (e.g. Becker and Huselid 2006; Syväjärvi and Kesti 2012).

Practical development processes and tools that can be multiplied for different organizations has provided new information and encouraged the search for new patterns in organizational human capital based performance improvement. Although there is experience and evidence gained from several organizations in Finland, it is likely that this research is only the beginning of a new era in organization performance development research. Certainly when the methods and theories are

implemented in organizations with different cultural backgrounds there will be new interesting findings. For example, this research may give way to possibilities of adding value to human capital due to diligence so that the adjoining organization cultures and intangible human capital can be better utilized for growth.

It would be interesting to find out the effective and sustainable HRD meaning to staff retention. Furthermore, it seems that there are possibilities to foster workplace innovations through collective incentives, which could utilize HRD business performance calculation. I am also looking forward to collaboration with economical researchers, since this study indicates that human intangible assets connection to fiscal accounting and business planning can be improved. This research can be seen as emancipating, since it does not only improve the participating organizations and their practices, but it also creates methods and phenomenon that breaks the existing boundaries (see Zuber-Skerritt 1996).

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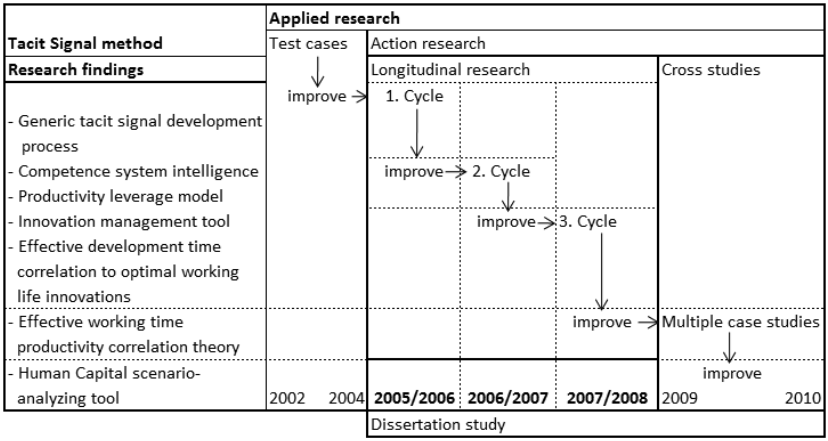
Appendices

Appendix 1. Test cases that were carried out preceding the research cases.

Year	Organization type	sample size	Measurement item	Note
2002	Printing and publishing company	44	Customer survey	
2003	Industrial company	699	Commitment, Leadership, Culture	Finnish, English, Swedish, Estonia
2003	Industrial company	93	Commitment, Co-operation, Strategy	Finnish, English, Germany
2004	Municipal organization (Oulu Information Technology)	495	Customer survey	Years 2004, 2006, 2008 and 2010
2003	Congregational organization (Oulu SRK)	118	Leadership, Culture, Teamwork	Years 2003, 2004, 2005, 2006 and 2007
2003	Privat Hospital (rehabilitation hospital)	46	Commitment, Leadership, Culture, Know-how	Years 2003 and 2004
2003	State organization (The Social Insurance Institution of Finland	302	Management commitment inquiry of values supporting strategy	
2004	Process industrial company	57	Leadership, Sales process, Change implementation, Information	Finnish, Swedish
2004	State organization (TE-Centre)	90	Commitment, Leadership, Culture, Customer service skills	
2004	Municipal organization (Technical Centre)	130	Customer survey	Years 2004, 2005, 2006 and 2007
2003	Municipal organization (Oulun Ateria)	3540	Customer survey (school catering)	Years 2003 and 2006
2004	Privat sales company	48	Leadership training effectiveness	
2004	Foundation	8	Leadership, Culture, Skills	
2004	Industrial company	10	HR-service development survey	
		5680		

Appendix 2. Table illustrates the research methodology and progress of the dissertation.



Appendix 3. Table depicts the list of longitudinal research case variables.

		Unit	Assumed depending relation			
Independent	Tacit signal process (TSP)	on/off				
variables	Group size	pcs				
Dependent	Leadership competence 2, 3	0-100%	TSP	Staff increase	Competences 1	Staff turnover
variables	Culture competence 2, 3	0-100%	TSP	Staff increase	Competences 1	Staff turnover
	Average competence increase	%	TSP	Staff increase	Competences 1	Staff turnover
	Revenue increase	%	TSP	Staff increase	Competences 1	Staff turnover
	Gross profit increase	%	TSP	Staff increase	Competences 1	Staff turnover
	HCROI increase	%	TSP	Staff increase	Competences 1	Staff turnover
	Average HCROI and revenue change	%	TSP	Staff increase	Competences 1	Staff turnover
	Staff turnover	%	TSP	Competences		
	Number of innovations	pcs	TSP	Effective development time		
	Number of improvement actions	pcs	TSP			
	Number of ideas	pcs	TSP			
	Effective development time	h	TSP	Competences		
Intervening	Staff increase	%				
variables	Leadership competence 1	0-100 %				
	Culture competence 1	0-100 %				
Sources of error	Multiple					

Appendix 4. Original articles.

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Encyclopedia of Human Resources Information Systems:
Challenges in e-HRM

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E–HRM in Competence Recognition and Management

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INTRODUCTION

The human resource management (HRM) can be structured according to different key perspectives (e.g., Stone, 2002). One viewpoint concerns the applications and information technology-based human resource information systems (HRIS) that can be seen as an additional solution to carry out the successful human resource management. The historical perspective of the current topic shows how organizations have had various management information systems and decision supportive systems. Both of these have direct links to human-computer interaction and human behavior (e.g., Zhang & Dillon, 2003). In management context, however, demand for successful HRM is challenging as human resources are led in specific situations (Hershey, Blanchard, & Johnson, 2000) and managed in changing organizational environments (Sashkin & Sashkin, 2003). Leadership studies have shown that management should be accompanied with the wide-range of managerial options. Hence, as one element of e-governance, there is need for advanced electronic human resource management (e-HRM) systems that are acceptable and effective (rf. Stone, Stone-Romero, & Lukaszewski, 2006).

The internal and external environment of organizations is indeed changing continuously which causes new demands: for the human competence and capacity (Leonard, 1998; Syväjärvi, Stenvall, Jurvansuu, & Harisalo, 2005), for the detection and recognition of those (e.g., Hershey, Blanchard, & Johnson, 2000) and for organizational perception (e.g., London, 2001). These fields are indeed a part of human resource management. The human competence (or capacity) refers here to behaviors and actions, but also to the tacit abilities underlying human behavior and action. Thus, need for developing the organizational information systems exists also in the field of HRM. Organizations want to improve their human competence detection and management.

Ghoshal, Bartlett, and Moran (2000) have showed that people's knowledge and competence will be an increasingly critical element of organizational success. Those who can recognize competencies, and further, who can create new knowledge will be successful in organizational settings (rf. Ghoshal et al., 2000; Stacey, 2001). However, the human competence is found so difficult and complex that its recognition or development for organizational purposes can not be easily completed by the management. In this context, the e-HRM systems are needed as those may provide valuable information for decision making. Electronic mechanisms or management information systems are of extreme importance as the information produced can be utilized in management (e.g., Zhang & Li, 2002).

Organizational benefits and success factors of electronic approaches are complex (Gil-Carcia & Helbig, 2006). Traditional HRM systems are repeatedly too expensive, quite slow, or otherwise complicated. These are simultaneously problematical in respect of the effective management. This article will search for a new e-HRM system to measure and analyze tacit human signals in organizations. Tacit signals refer to personal beliefs concerning both the recognitions and the improvement needs of human competencies (rf. Stone, 2002; Syväjärvi et al., 2005), but as well to the fundamentals of effective leadership (Kets de Vries, 2006). Hence, a research question is set as follows:

What type of e-HRM system is needed for tacit signal and human competence recognition and respectively for effective management?

An information system can be seen as physical process that supports an organization by providing critical information to achieve goals (Syväjärvi & Stenvall, 2006). New tacit signal based e-HRM system is introduced as a human resource information system. The current e-HRM is seen as dialogic, fluent, accurate, and fast responding system that serves simultaneously the needs of HRM, subordinate actions, and e-governance. Hence, the e-HRM system is an instrument for effective management. The tacit signal e-HRM method is not a system of ultimate kind, but serves as an electronic tool of HRM to determine the tacit signals and to analyze human signals in time. The method allows leadership to accomplish productivity actions across the organizational work society.

BACKGROUND

In modern organizations, the control of e-governance, knowledge, and intangible assets has become one important factor for success. To be successful an organization should have processes where individuals and groups are able to reflect knowledge and experiences, and further, can improve their contribution to the organizational objectives. It shown by several researches that organizations committed to the employees and those letting the tacit knowledge base to increase are successive ones in a longer term (e.g., De Geus, 1997). In some environments, the intangible assets are probably key issues when creating competitive advantage (Kaplan & Norton, 2004). The intangible assets may create the main part of the organization growth and appreciation (Lev, 2004). Therefore, the human intangible asset should be an important development target. As indicated earlier, these human properties or intangible assets of performance are quite difficult to recognize and develop.

In organization, the knowledge is created by collective learning and sharing of information (Prahalad & Hamel, 1990). Knowledge can be divided, for example, to explicit and tacit knowledge. Explicit knowledge is rational and can be described and visualized by documents and pictures. Tacit knowledge is experience based knowledge that is difficult or impossible to document or describe by words. Tacit knowledge is highly personal emotion and feeling based and therefore difficult to express. Nonaka and Takeuchi (1995) describe the new knowledge creation with interactive social process between explicit and tacit knowledge. Tacit knowledge has to be formulated to words or documents so that it can be further converted to explicit knowledge which creates again new tacit knowledge. Social intercommunication like dialogue, discussion, and observation speeds up the knowledge creation process and activates organizational learning. In the current study, the strategically relevant competence (or tacit signal) is never certain, but rather exists in the form of beliefs which are inconsistent or contradictory.

THE TACIT SIGNAL AND E-HRM

Tacit signals can be seen employees' personal beliefs concerning the human competencies. Those are, for example, related to improvement needs of competencies. As an organization is influenced by beliefs, the competence factor can be developed more consistent and conjunctive with the organization. Tacit signals are personal, situational experiences and emotional knowledge which are typically difficult to express by words. Measuring tacit signals and analyzing them relevantly and timely, so that they guide to improvement actions, the people can be managed subjectively and proactively.

Proactive operating method makes it possible to do preventive actions in accordance with ISO 9000:2000 to find things affecting to quality before realization. Measuring tacit signals fits well for the balanced scorecard like company-based measures for the learning and growth perspective (Kaplan & Norton, 2004). The measured human competence factors can be linked also to other scorecards. Moreover, the main idea in the tacit signals e-HRM system is to recognize human potential in both personal and group levels, to optimize the quality of HRM, and to increase co-operation across organization. The e-HRM system improves the organization's ability to prioritize the development actions of competencies and it allows doing improvements effectively.

DICHOTOMY PRINCIPLES FOR THE USE OF E-HRM

The principle of interrelated and opposing factors is raised in several organizational circumstances. Researches have shown multitude dichotomies—such as tacit vs. explicit, mind vs. body, self vs. others—that affect on the organization's knowledge creation. These dichotomies are not different coins but rather the opposite sides of the coin being mutually complementary (e.g., Nonaka & Takeuchi, 1995). The optimal condition exists when affecting the two paired sides in a balanced way. In addition, the development need is determined as the unbalance occurs. The dichotomy principles of the current e-HRM can be compared and clarified in respect of the Likert scale.

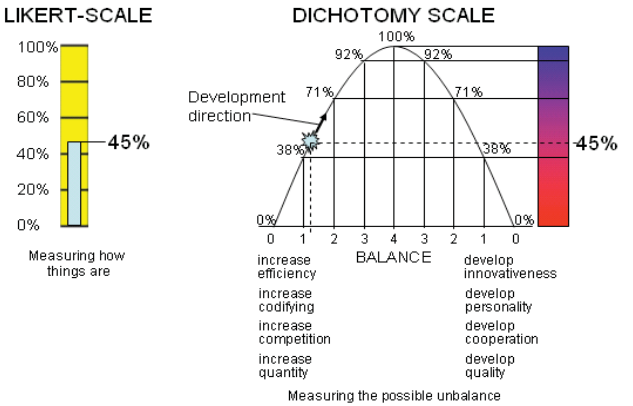
Development focus is on the side of unbalance. As time goes by the unbalance may again prevent the optimal intangible assets utilization. Likert-scale queries measures the state and development need, but does not show the direction for development. Tacit signal e-HRM system measures the development need with the direction. The development is needed if the two interrelated guiding forces are not in balance. If unbalance exists, individuals have to prioritize the development direction.

Among the HRM experts, the most common form of knowledge management strategies are perhaps codifying and personalization strategies (Hansen et al., 1999). Also, two opposite dynamic forces, that is, competition vs. cooperation, are involved. Management should agree about the implemented strategy, since the use of multiple strategies may cause failures. In organization development, it is crucial to know and agree which side the improvement focus is located. If not being able to make a decision, it may also cause managerial conflicts (i.e., hinder effective management) that may even paralyze the organization (rf. Hansen et al., 1999).

THE TACIT SIGNAL HRIS

The balanced scorecard is lacking good company specific measures for the learning and growth perspective. The absence of specific measures may indicate that the organization is not connecting its strategy objectives to crucial activities like: updating employee's competencies, supplying relevant information, and aligning individuals, teams, and organizational units to the company's objectives (e.g., Kaplan & Norton, 2004). The current tacit signals e-HRM system makes it possible to measure and analyze tacit signals in real time. The system is based on both the dichotomy scale self-assessment and analyzes of competence potential vectors.

Figure 1. New dichotomy scale compared to Likert scale



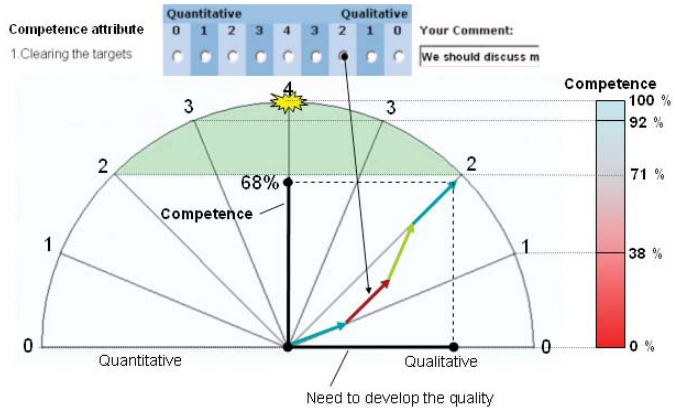
The specified tacit signals HRIS consists of following measuring principles:

- The specified human competence measurement has several competence attributes which are evaluated by the dichotomy scale of guiding forces to help human resource decision making.
- Tacit signals are inquired systematically for specified human driver of performance (human competence, intangible asset).
- Opinion includes the guiding factor and possible informal comments for each question are included in the measurement.
- Each individual answers are under the influence of their personal tacit signals which are highly respected by privacy in the tacit signal e-HRM system.
- The guiding forces are to be chosen so that it meets the dichotomy principle of two interrelated and opposite forces like rational vs. emotional or quantitative vs. qualitative.
- One force is guiding to more straightforward actions and the other is more related to emotions needing usually a dialog between the parties and individuals to be improved and understood.

Measuring tacit signals needs a query that goes well together with the dichotomy scale. Tacit signals are shown by vectors at the dichotomy improvement semicircle. Each employee is indeed a knowledge worker and subject that have important tacit knowledge about the organization operations and their own work. An individual has skills, knowledge, and energy that organizations try to benefit. Human drivers of performance are the known competence factors contributing the organization to improve productivity and achieving the target. Each human driver of performance is build from participating individual competence potential. Competence potential has a direction which shows how much of the competence potential is utilized. In this specification, the potential can be shown as a vector where the part leading towards the target is the competence.

When two totally contrasting potential vectors are summed, the result does not lead anywhere. This situation can occur when opposite opinions cause conflict and hinder the decision making. When these two persons discuss and agree the progress, the collective competence is double for both potential vectors point to the same direction and competence potential is optimally utilized. Tacit signals approach starts with the identification of the performance drivers. Each performance driver is specified with the dichotomy guiding forces and competence attributes to be evaluated. Competence attributes (that originate from the science literature) are chosen as having valid importance in the direction of organizational goals.

Figure 2. An example shows tacit signal vectors of four individuals evaluating one competence attribute. At the right from the semicircle is the competence level scale.



As the given example indicates, the dichotomy improvement semicircle is adaptive according to the size of the group so that every individual tacit signal vector can be summed. Further, this signifies the collective development needs and competencies. Tacit signals vector analyses thus provide following information:

- Collective judgment about how much the competence attribute needs to be developed (i.e., competence level)
- How homogenous is the collective development need showing each individual opinions (i.e., vector direction)
- The optimal improvement force (i.e., parallel direction) or the need for improving the both guiding forces together (i.e., diverse outcome)
- Additional comments to be considered as improving the competence attribute

In addition, the knowledge creation process includes that the results are gone through (at each group) the management review. At the HRM review, the organization is analyzed according to the system approach. This guarantees that the so called big picture of organization development is detected. After that, each group goes through their own results by discussions. Individuals and groups are able to both recognize the corrective actions and determine essential actions. This session takes 2-3 hours and is effective, because e-HRM leads to explicit results, to constructive discussions and to concrete development actions.

Due to the current e-HRM system, the human resource based development needs are evident as every estimated competence items have vector sum ups. By measured tacit signals, individuals and groups know how to improve the human competences which are linked to organizational targets. Finally, the effective HRM actions can be executed as it is known now the areas of development actions and the magnitude of actions.

FUTURE TRENDS

In the future, organizations will over again face the changing environment. The challenge for HR managers is to embrace the new HRIS, since organizations are built on the basis of important intangible drivers of performance. In the current framework, each intangible driver of performance has several attributes that illustrate the human success factors. The human tacit signal balance will be needed to show if certain features need reinforcement or development. Unbalance in the reinforcement side means that the attribute is not activated and strong enough to form a positive spiral in the organization system. Unbalance in the development side means that the attribute affects negatively the two following drivers of performance. Therefore, the development need is more critical for the future organizations and managers, since it is important to solve the everyday problems and simultaneously to strengthen the intangible performance drivers that have positive influence. By seeing and analyzing the organization as a system, with interrelated human performance drivers, the organization can be developed more optimally and with increased human capacity.

Argumentation and evidence exist how in the future e-HRM systems provide such intelligence that helps organizations to operate both proactively and effectively. In electronic governance, this is done by utilizing more human drivers of performance, but with the notion that HRIS users will have different requirements from information systems. Thus, increasing requirements are set for flexible e-HRM approaches as simultaneously, organizations will probably be even more complex to manage. Decision making concerning the human asset will be more challenging as organizations are getting even more diverse and complex.

Organizational and knowledge complexity exist in different forms and one major aspect considers humans. Further study is needed in order to enhance the realization of this importance of the organizational asset. One approach is the tacit signal e-HRM research so that the managers may use faster and more accurate decision making instruments. There will be a call for continuing HRIS research. Firstly, how HRIS research will assist managers in accurate and timely decision making? Secondly, how to manage with the increasing human diversity? Thirdly, how to understand humans in respect to both organizational complexity and productivity?

CONCLUSION

The organizations in both the public and private sector should try to identify the factors that affect on the productivity and the development of their own. By

benefiting better the unidentified human assets, the public and private organizations can become aware of how the human factors (Sandberg & Yan, 2006) can create a positive impact. The proper e-HRM systems allow the organizational leaders to be more aware about human organizational behavior. Systems also help to understand how electronic aids work as functional versus dysfunctional consequences for individuals and organizations (Stone et al., 2006). The e-HRM is one way to develop effective human management as opening the black box of leadership (rf. Kets de Vries, 2006).

Furthermore, the tacit signal e-HRM method can be related into the principles of high-performance work design as it serves effective leadership. Becker and Huselid (1998) have showed that the high-performance work design is needed in order to guarantee successful organizational activity. This has been the case as the e-HRM system has been developed and tested in various organizational situations. Empirical research has shown the effectiveness of existing tacit signal e-HRM system. The system has worked both for public sector organizations and private organizations. So far the e-HRM system has been developed and investigated with 50 organizations and many thousand tacit signals have been recognized. Hence, the e-HRM system of the current kind works like a managerial instrument for human competence recognition, organizational knowledge identification, and knowledge creation (rf. Stacey, 2001) conceptualization.

Each organization is unique so the approach to tacit signals should be customized and flexible. Stone (2002) has indicated an antiquated HRIS is a hindrance to both HRM and organizational performance. The current system has shown to be fast, accurate, and responsive. The people in organizations are able to share the knowledge and to agree about improvement actions. It seems that the tacit signal e-HRM system indeed speeds up the managerial actions and makes actions more accurate. The tacit signal e-HRM system produces valid data for HR decision making, strategic planning, more flexible working practices, human resource allocation, and of course, for the human resource management. These improvements can be linked to the organization's knowledge sharing, human wellbeing, division of labor, values and beliefs, and to the productivity and cohesiveness of people, which are characters of the competent management (e.g., Cameron & Quinn, 2006; Kets de Vries, 2006; Syväjärvi et al., 2005).

Finally, organizational benefits are benefits related to the solution of organizational problems or the enhancement of various capabilities (Dawes & Pardo, 2002). By current tacit signal e-HRM method, it is possible to relate the human capability success factors with a positive spiral and thus to minimize the risk of low human competence utilization. It is shown that the management of organizational feedback has potential contribution to organization success (e.g., Greller, 2003). As tacit signals are analyzed in real time and the improvements actions can be located, it is possible to start development steps without a delay. Normally these steps have a huge and motivating effect to all stakeholders. By competent managerial use, the system may reduce duplicate data collection, processing and storage, and further it recognizes critical benefits and factors related to e-government (see Gil-Carcia & Helbig, 2006).

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KEY TERMS

Attribute: A human property or characteristic in organizational environment that has value. It is one kind of data about the nature of the human-organization environment. It shows how individuals can be distinguished.

E-Governance: Governance in electronic environment that comprises functions, processes, practices, and actions through digital means.

HRM Dichotomy: Division into two parts as human resource management objectives or interrelated factors are subdivided into two mutually opposed or contradictory pairs.

Human Competence: A human property or characteristic according to which one has knowledge, capability, and skills in a certain task to perform or behave. It is the ability to successfully carry out an activity which is identified

Information System: An information system is a system of communication between people and it involves the gathering, processing, and use of information.

Intangible Assets: Human capital, database or information system, responsive process, customer relationship, innovation capability, and culture of an organization that all are needed for distinctive and sustainable value.

Tacit Signals: Signals related to the known attribute of an intangible driver of human performance. Represent competence, opinion, intelligence, or emotion that operates as an improvement factor.

Hiljaiset signaalit HRIS: yksi ratkaisu organisaation inhimillisen pääoman ja henkilöstötuottavuuden kehittämisessä

Kesti Marko, Antti Syväjärvi & Jari Stenvall

ABSTRACT

The current article demonstrates how tacit signals are used at human competence recognition and how competence development might affect on organizational productivity. Article gives research information to the competence and information based human resource management, and finally to e-HRM and HRIS in competence recognition and management.

Tacit knowledge is experience based knowledge that is difficult or impossible to document or describe by words. Tacit signals are personal, circumstances and item connected guiding beliefs that arise from tacit knowledge. Tacit signals are related to competences which are important for strategy implementation and productivity. Competences are measured by tacit signals and developed systematically. Tacit signal competence development process generates improvement ideas and leads to optimal development in practice. Action based research study was done at large business enterprise employing approximately 1000 workers.

Research indicates strong correlation between measured competences and organization productivity. Competence improvement process seems to affect positively to the organization productivity and growth. Growth was measured by revenue and number of employees. Organization productivity was measured by HCROI (human capital return on investment) which is salesmargin divided by employee costs.

It seems that tacit signal measurement guides to the optimal development with minimal organizational effort. Systematic and effectively carried out organization competence development increased working societies innovativeness to solve the problems that inhibit the effective working. Therefore tacit signal competence development process seems to be effective enough to improve organization productivity.

Key words: competence, human resource management, information management, information system, productivity, tacit signal

JOHDANTO

Inhimillistä tai aineetonta pääomaa osana organisatorista kokonaisuutta on tutkittu intensiivisemmin alkaen 1960 luvun lopulta. Becker (1964) on ehkä näkyvimmin lanseerannut organisaation henkilöstöön liitettävän pääomakäsitteen. Inhimillisellä pääomalla tarkoitetaan ihmiseen usein aineettomasti liittyvän kapasiteetin ja kompetenssin kokonaisuutta, joka inhimillisen toiminnan kautta voi välittyä voimavarana organisaation käyttöön. Tällaisen aineettoman pääoman uskotaan saavan aikaan merkittävän osan yrityksen kasvusta ja sen arvon noususta (Lev 2004).

Henkilöstöön sitoutuvan pääoman jalostaminen liittyy organisaation kykyyn tehdä hyviä suorituksia nyt ja tulevaisuudessa (Lönnqvist ym. 2005). Haastetta on myös siinä, miten kyvykkyydet, kompetenssit ja niin sanottu hiljainen tieto voidaan hyödyntää organisaatiossa (mm. Spencer & Spencer 1993, Kesti 2005). Hiljainen tieto viittaa inhimilliseen aineettomaan pääomaan, jota voidaan hyödyntää kompetenssina eli kyvykkyytenä ja kapasiteettina organisaatiossa. Kustannusten noustessa, kilpailun kiristyessä ja monimuotoisuuden lisääntyessä on henkilöstöön liittyvää tuottavuutta pysyttävä kehittämään ja hallitsemaan, jotta organisaation kannattavuus ja kilpailukyky säilyvät hyvänä (vrt. Hannula 1999; Stacey 2001). Voimakas panostus organisaation kehittämiseen saattaa kuitenkin aiheuttaa niin paljon kustannuksia ja työtä, että kannattavuus voi laskea ennen tuottavuuden nousua (Lönnqvist ym. 2005). Lyhytnäköisessä tarkastelussa kannattavuuden lasku johtaa päätöksentekoa kustannusten säästämisen suuntaan. Tällöin usein myös oman toiminnan kehittämisinvestoinnit jäädytetään. Siten tarvitaan vaihtoehtoisia menetelmiä edellä mainittujen ongelmien ratkaisuun.

Ongelmana usein on vaikeus johtaa tai kehittää henkilöstön kyvykkyyksiä ja aikaansaada positiivinen ihmisistä lähtevä muutos organisaation toiminnassa (Becker & Huselid 1998, Syväjärvi & Stenvall 2003). Esimerkiksi Becker ja Huselid (1998) toteavat, kuinka muutostilanteessa tarvitaan henkilöstövoimavarojen johtamista vallitsevan vaatimustason edellytysten mukaisesti, jolloin työn organisoinnista muodostuu keskeinen muutoksen turvaaja ja toiminnallisen tehokkuuden mahdollistaja. Syväjärvi ja Stenvall (2003) korostavat myös henkilöstövoimavarojen johtamisen merkitystä ja kuinka henkilöstön ominaisuudet, kompetenssit ja toimijakäyttäytyminen ovat keskeisessä suhteessa organisaation menestykseen. Hattorin ja Lapiduksen (2004) mukaan valitsemalla organisaatiotilanteisiin sopivat yhteistoiminnan muodot ja investoimalla luottamukseen sekä henkilöstön yhteisöllisyyden kehittämiseen, voidaan saada aikaan toimijoista lähtevää menestystä. Toisaalta kehittäminen voidaan kokea vaikeaksi ja liikaa resursseja vieväksi toiminnaksi, jonka yhteys taloudellisiin tuloksiin koetaan epäselvinä. (Ylöstalo 2005).

Organisaation kyvykkyyksien kehittämisen ei tulisi olla lyhytjänteistä, sattumanvaraista ja projektiluonteista toimintaa. Francis (2003) toteaa, että toimijat ovat hyvin erilaisia ja siksi tarvitaan henkilöstön suunnitelmallista, monipuolista, osaavaa ja kestävää johtamista, jotta dynaamisessa organisaatioympäristössä voidaan ylipäätänsä menestyä. Organisaation tuottavuuden ja kilpailukyvyn kehittäminen kyvykkyyksiä parantamalla onkin osa pitkäjänteistä strategista henkilöstövoimavarojen johtamista. Strategisen suunnitelman tulisi olla jatkuvasti päivittyvä ja vähintään 5-vuoden mittainen, jolloin on mahdollista saavuttaa pysyvää kilpailuetua (Collins 2001).

Organisaation henkilöstölähtöisessä johtamisessa on mahdollista hyödyntää informaatioteknologiaa. Pelkkä informaatioteknologian käyttäminen ei kuitenkaan välttämättä tuo toivottua kehitystä, vaan hyötyjen saaminen edellyttää myös organisaation toimintatavan muuttamista henkilöstösidonnaisia työtapoja ja -menetelmiä kehittämällä (Stone ym. 2006; Kesti ym. 2008). Henkilöstön kehittämistarpeet ja -ideat voidaan selvittää esimerkiksi hiljaiset signaalit E-HRM ratkaisulla, jolloin tulokset saadaan responsiivisesti ja reaaliajassa (Kesti ym. 2008). Näin organisaation toimintaa parantavat toimenpiteet saadaan käyntiin nopeasti. Hiljaiset signaalit mittaus yhdistettynä sähköiseen analysointityökaluun muodostavat tehokkaan HRIS järjestelmän (Human Resource Information System).

Suunnitelmallisten ja toimivien HRIS käytäntöjen avulla organisaatiossa on mahdollista saada käyntiin kehittävät toimenpiteet nopeasti ja tehokkaasti. Parhaimmillaan HRIS voi luoda edellytyksiä nopeaan organisaation tuottavuuden parantamiseen kohtuullisen pienillä kustannuksilla. HRIS:n avulla organisaation kehittäminen voidaan liittää osaksi organisaation johtamisjärjestelmää (vrt. Zhang & Li 2002, Stone ym. 2006), jolla systemaattisesti parannetaan sekä henkilöstön kyvykkyyksiä että organisaation liiketaloudellisia tuloksia. Tuottavuuden nousua voidaan saada aikaan myös laatukustannuksia vähentämällä. Esimerkiksi kauppa- ja teollisuusministeriön teettämien tutkimusten mukaan yritysten tiedossa olevat laatukustannukset ovat keskimäärin 6 % liikevaihdosta ja suurimpana tekijänä laatukustannuksiin pidetään organisaation toiminnassa esiintyvää sähläystä, joka aiheuttaa paljon turhalta tuntuvaa työtä kuten etsimistä, hakemista ja korjaamista (Andersson ym. 2004). Jatkuvaan menestykseen panostaville organisaatioille on tunnusomaisia toimintatapoja, mutta Suomessa vain noin 4 % kykenee systemaattisesti hyödyntämään näitä työn uusia organisointitapoja (Ylöstalo 2005). Useimmiten uudistusten ja muutosten vaativat panostukset ovat niin työläitä, että ne lyhyellä aikajänteellä näyttävät pikemminkin ku-

luttavan resursseja, jotka pitäisi käyttää operatiiviseen tuottavaan toimintaan (Ylöstalo 2005).

Henkilöstölähtöistä tuottavuutta on yritetty mitata tunnusluvuilla, kuten myynti, myyntikate, henkilöstökulut (sis. palkat sivukuluineen ja eläkemenot), vaihtuvuus, poissaolot ja henkilöstömäärä (Kesti 2007). On tärkeää, että henkilöstö voi kyvykkyyksillään vaikuttaa seurantamittareihin. On mahdollista ajatella, että kyvykäs henkilöstö parantaa organisaation toimintaa liiketoimintalähtöisesti esimerkiksi myymällä enemmän tai käyttämällä tehokkaammin aineet, materiaalit ja ostopalvelut, jolloin myyntikate paranee. Henkilöstötuottavuuden yleisenä indikaattorina voidaan pitää HCROI:ta (Human Capital Return On Investment), joka saadaan jakamalla myyntikate henkilöstökuluilla (Fitzenz 2000).

Hyvin henkilöstö- ja asiantuntijavaltaisessa julkishallinnossa inhimillisen pääoman ja henkilöstötuottavuuden kehittäminen ovat myös yhä keskeisemmällä sijalla. Henkilöstötuottavuus on tärkeä julkishallinnossa, jossa esimerkiksi tilaaja-tuottajamallin mukaan haetaan kustannustehokkaampia tapoja kuntien palvelutuotantoon. Julkishallinnon uudelleenjärjestelyillä haetaan parempaa organisaation suorituskykyä jolloin vaarana voi olla, että henkilöstö ei kykenekään sopeutumaan vaadittuun muutokseen. Siten tieto inhimillisestä pääomasta, sen kyvykkyydestä ja toiminnan tilasta on merkityksellistä. Vastaavasti toimintatapojen muutoksissa on perusteltua seurata henkilöstötuottavuuden tunnuslukuja ja panostaa henkilöstön kyvykkyyksien kehittämiseen.

Tutkimustehtävä, -menetelmä ja -aineiston kuvaus

Tämän artikkelin haasteena on tunnistaa vaikeasti hahmotettava yhteys henkilöstön toiminnan ja sen kyvykkyyden sekä henkilöstölähtöisen tuottavuuden kanssa. Lisäksi pyritään selvittämään, kuinka hyvin henkilöstövoimavarojen johtamista voidaan toteuttaa hiljaisia signaaleja mittaamalla ja analysoimalla. Tutkimus on hyvin ajankohtainen, sillä henkilöstön toiminnan tuottavuutta on perinteisesti ollut vaikea lähestyä, asiasta on kohtuullisen vähän tutkimusta ja toisaalta johdon tietojärjestelmät ja HRIS järjestelmät näiden osana kehittyvät vauhdilla. Artikkelin tutkimustehtävä muodostuu seuraavista kysymyksistä:

Miten organisaation kyvykkyyksien kehittyminen kytkeytyy henkilöstötuottavuuteen?
Miten organisaatioita voidaan systemaattisesti kehittää hiljaiset signaalit HRIS avulla?

Tutkimus edustaa toimintatutkimusta, jossa on käytetty hiljaiset signaalit HRIS menetelmää (Tacit-signal HRIS) organisaation kyvykkyyksien kehittämiseen (Kesti ym. 2008). Toimintatutkimuksessa pyritään muuttamaan tutkittavaa todellisuutta, ottamalla käytännössä toimivat ihmiset aktiivisiksi osallistujiksi tutkimuksessa (Kuula 1999). Koska halutun muutoksen aikaansaamisen lisäksi yhtenä keskeisinä tavoitteina on valitun teorian testaaminen ja edelleen kehittäminen, on kyseessä myös tutkimussuuntautunut toimintatutkimus (vrt. Jyrkämä 1978).

Kyvykkyyksien kehittäminen voidaan tehokkaasti toteuttaa mittaamalla henkilöstön kehittämisnäkemyksiä hiljaiset signaalit mittausmenetelmällä, tekemällä laadullista aineistolähtöistä analyysiä ja arvioimalla kokonaisuutta, jotka yhdessä ohjaavat organisaatiossa henkilöstövoimavarojen johtamisen toimenpiteisiin. Erilaisista menetelmällisistä lähestymistavoista koostuvat kehittämisen vaiheet ovat valmistelu, mittaus, analyysi, kehittäminen, seuranta ja arviointi. HRIS kokonaisuus rakentuu siten menetelmätriangulaation periaatteilla (Patton 2002), jonka myötä se kytkeytyy kokonaisvaltaiseen organisaation kehittämisen prosessiin. Näin toimimalla pyritään luomaan HRIS ratkaisu (kehittämisprosessi), jonka avulla kohderyhmän kyvykkyyksiä voidaan parantaa mahdollisimman tehokkaasti ja luotettavasti tilanteeseen sopivilla toimenpiteillä. HRIS palvelee siten strategista henkilöstöjohtamista (SHRM), jonka tavoitteena on aktivoida toimintaa, jolla johto ja henkilöstö voivat kehittää organisaation henkilöstövoimavaroja (mm. Francis 2003).

Organisaation henkilöstölähtöinen kehittämisprosessi etenee seuraavien vaiheiden mukaisesti. Ensin valmistellaan kehittämisprosessi sopimalla johdon ja henkilöstön edustajien kanssa keskeiset kyvykkyydet, joissa halutaan onnistua (HRIS valmistelu). Seuraavassa vaiheessa kerätään työyhteisökohtainen kollektiivinen kehittämiseen ohjaava tieto hiljaiset signaalit kyselyillä (HRIS mittaus), jonka jälkeen tulokset käydään läpi johdon kanssa ja laaditaan tilanneanalyysi organisaation kyvykkyyksistä sekä strateginen toimenpidesuunnitelma (HRIS analysointi). Neljännessä vaiheessa jokaisessa kohderyhmässä käydään työntekijöiden ja esimiesten kanssa läpi omat kehittämistulokset, ideoidaan ja

sovitaan yhdessä konkreettiset toteutettavat toimenpiteet (HRIS kehittäminen). Tämän jälkeen tuetaan ja seurataan toimenpiteiden toteuttamista seurantakäynneillä ja tukipalveluilla (HRIS seuranta). Organisaation kehittämisprosessin viimeinen vaihe on arviointi, jossa tarkastellaan kehittämisen vaikutuksia henkilöstötuottavuuteen ja organisaation toimintaan (HRIS arviointi).

Tutkimuksen kohdeorganisaationa oli henkilöstömäärältään hieman yli 1000 hengen yritys. Tutkimukseen osallistui 20 tulosvastuullista yksikköä (kohderyhmää) eripuolilta Suomea. Näiden organisaation erillisten tulosvastuullisten yksiköiden koko vaihteli 15–125 työntekijän välillä. Keskimääräinen yksikkökoko oli 54 työntekijää. Kohdeorganisaatio on vakiinnuttanut toimintansa ja sen yksiköissä työskennellään varsin keskusohjatusti. Lähtökohtaisesti kaikissa yksiköissä on henkilöstön perusosaaminen toisiaan vastaavalla tasolla ja yksiköt muodostavat keskenään vertailukelpoisen tutkimuskohdejoukon.

Tutkimuksessa on seurattu kohdeorganisaation tulosvastuullisten yksiköiden kasvua ja henkilöstötuottavuuden tuloskorttien muutosta suhteessa mitattuihin kyvykkyyksiin. Tutkimustapauksessa sovitut mitattavat kyvykkyydet olivat esimiestoiminta, toimintakulttuuri, asiakaspalveluosaaminen ja tiedottaminen. Henkilöstö vastasi sähköisiin toimintaa ohjaaviin kyselyihin selaimen kautta. Tulokset kerättiin yhteiseen tietokantaan, josta ne analysointiin hiljaiset signaalit analysointimenetelmällä työyhteisökohtaisiin kehitysviuhkoihin. Jokainen kyvykkyys analysoitiin erikseen jokaista työyhteisöä kohti. Kaikissa työyhteisöissä toteutettiin mittaukseen perustuva kyvykkyyksien kehittämisprosessi.

HRIS tarjosi työyhteisökohtaisiin kehittämispalavereihin optimaaliset kehittämiskohteet ja toimintaa ohjaavan kollektiivisen tiedon toimenpiteiden sopimiseen. Palaverissa tarkasteltiin kollektiiviset kehittämisnäkemykset ja ideat, joista yhdessä muodostettiin konkreettisia parantavia toimenpiteitä. Toimenpiteistä valittiin jokaisessa työyhteisössä noin neljä kehittämistoimenpidettä, joita työyhteisöt lähtivät toteuttamaan esimiehen tai esimiesten tukemana. Tämä työyhteisön kehittämispalaveri kesti 2–3 tuntia. Muutaman kuukauden kuluttua pidettiin jokaisessa työyhteisössä seurantapalaveri. Sekä kehittämispalaveri että seurantapalaveri tehtiin asiantuntijan toimesta samalla systemaattisella tavalla.

Vuoden kuluttua ensimmäisestä mittauksesta tehtiin hiljaiset signaalit toistomittaus, joka käynnisti uuden organisaation kyvykkyyksien kehittämisprosessin kehittämis- ja seurantapalavereineen. Henkilöstötuottavuuden tuloskortteja seurattiin ennen tutkimusta ja tutkimusvuoden jälkeen. Kyvykkyyksien lähtötasoa verrattiin mittausta edeltävän vuoden henkilöstötuottavuuden tuloksiin. Kyvykkyyksien kehittyminen saatiin toistomittauksesta, jonka väli siis oli 12 kk. Toistomittauksen tuloksia verrattiin toimintatutkimuksen aikana syntyneisiin liiketoiminnan tuloksiin.

Katsaus teoreettiseen taustaan

Henkilöstövoimavarojen hallintaa voidaan hahmottaa monin eri tavoin. Erilaiset lähestymistavat voivat liittyä muun muassa teoreettiseen näkemykseen, henkilöstön toimintaan, johtamiseen jne. Tässä artikkelissa lähestytään henkilöstövoimavaroja holistisesta näkökulmasta ja muodostetaan yleisesti käytäntöön sovellettava pluralistinen organisaation kehittämisratkaisu, joka mahdollisimman hyvin yhdistää eri lähtökohdista nousevia henkilöstöjohtamisen näkemyksiä.

Liiketoiminnan menestystekijät ja organisaatioiden toimintatavat ovat ratkaisevasti muuttuneet 1970-luvulta tähän päivään. Muutosnopeuden kasvaessa on organisaatioiden kyvykkyyksien pitkäjänteinen kehittämisen entistä tärkeämpää (Andersson ym. 2004). Organisaatioilta vaaditaan tunneälykkyyttä (emotional intelligence), jonka avulla henkilöstön suorituskyky ja muutokseen sopeutuminen paranevat (Goleman 1998). Organisaation on hyvä tunnistaa sille tärkeät kyvykkyydet, jotta se voi kehittää niihin liittyvää tunneälyä ja rakentaa kyvykkyyksistä kompetensseja. Mikäli valittujen kyvykkyyksien kehittäminen vaikuttaa suotuisasti organisaation liiketoiminnan tuloskortteihin, soveltuvat ne tasapainotetut tuloskorttimittariston (BSC) kasvun ja kehittymisen mittareiksi (Kaplan & Norton 1996).

Organisaation kehittäminen tarkoittaa systemaattisesti johdettua ja koko henkilöstöä koskevaa organisaation kyvykkyyksien parantamista (French & Bell 1999). Kehittäminen vaatii muutoksen toteuttamista mitattujen kehittämistarpeiden mukaan. Kaikkein parhaita asiantuntijoita ovat organisaatiossa työskentelevät työntekijät, joilla on kertynyt paljon työhön liittyvää hiljaista tietoa (Nonaka & Takeuchi 1995). Hiljainen tieto (tacit knowledge) on kokemusten ja perehtymisen kautta syntynyttä tiedostamatonta osaamista ja taitoja,

joita on vaikea pukea sanoiksi (Nonaka & Takeuchi 1995). Työntekijöiden omaama hiljainen tieto on organisaation kannalta elintärkeää. On kuitenkin huomioitava, että osa hiljaisesta tiedosta on organisaation kannalta haitallista. Ne voivat esimerkiksi ylläpitää erilaisia puolustusmekanismeja, jotka estävät organisaation kehittymistä (Senge 1990). Onkin erittäin tärkeää, että kehittäminen toteutetaan ja kohdennetaan siten, että edistetään organisaation toivottua positiivista kehitystä. Tehokas organisaation kehittäminen on ratkaisukeskeistä ja kohdistuu toivottujen kyvykkyyksien vahvistamiseen (Kesti ym. 2008).

Kyvykkyyksien kehittämistarpeet voidaan mitata hiljaiset signaalit HRIS menetelmällä (Kesti ym. 2008). Hiljaiset signaalit ovat toimintaa ohjaavia mielipiteitä ja tuntemuksia, jotka kumpuavat henkilön hiljaisesta tiedosta (Kesti ym. 2008). Kun kehittämistarpeet on mitattu toimintaa ohjaavasti, voidaan muutos toteuttaa tehokkaasti. Muutoksen sujuva toteuttaminen vaatii käyttäytymistieteen tuntemusta sekä käytännön toimenpiteitä, joilla aktivoidaan organisaation kehittyminen (French & Bell 1999). Mitatut ja kehitettävät kyvykkyydet vaikuttavat henkilöstötuottavuuden tuloskortteihin.

Kontingenssisen painotuksen mukaan organisaatioissa on paljon muuttujia eli ei ole olemassa yhtä optimaalista organisaatiorakennetta tai toimenpidettä, joka toisi toivotun paremman suorituskyvyn (Fiedler & Garcia 1987). Organisaation rakenne esimerkiksi on vain mahdollistava tekijä, joka ei missään tapauksessa yksistään riitä organisaation suorituskyvyn parantamiseen (Drucker 1989, Heller 1996, Forte 1986). Lee (2007) esittää holistista henkilöstövoimavarojen hallinnan näkökulmaa osana henkilöstöjohtamista eli kokonaisvaltaista ja eri lähtökohdista nousevaa ajattelua. Syväjärvi ym. (2007) korostavat psykologisen johtamisen, tajunnallisten kokemusten ja vaihtelevien tilannetekijöiden merkitystä henkilöstön toimintaan. Alasoini (2007) on viitannut siihen, kuinka yleispäteviä henkilöstövoimavarojen johtamisen keinoja ei välttämättä ole, vaan suorituskyvyn yhteyteen on liitettävissä tilannekohtaisesti yhteensopivia ratkaisuja. Optimaalisia kehittämistoimenpiteitä ei yleensä voida määrittää etukäteen ilman syvällistä perehtymistä tilanteeseen, toimintaan ja työntekijöihin. Jokainen ryhmä on uniikki ja vaatii omanlaisensa toimenpiteet, sillä toimintaan vaikuttavia syy-seurausmuuttujia on niin paljon.

Kesti (2005) määrittelee henkilöstötuottavuuden virtausmallissa tärkeiksi työyhteisön kyvykkyyksiksi esimiestoiminnan, toimintakulttuurin, osaamisen sekä sisäisen viestinnän. Johtaminen ja toimintakulttuuri ovat asiantuntijoiden mukaan kyvykkyyksiä, jotka pitäisi erityisen tarkasti selvittää, jos halutaan vähentää työperäistä haitallista stressiä (Lucas 2003). Tutkimukset osoittavat, että esimerkiksi tavoitteet, perustehtävä, palkitseminen, kannustus ja henkilöstöstä välittäminen korreloivat tuottavuuden kanssa (Buckingham & Coffman 1999). Taatila (2004) on organisaation kompetenssitutkimuksessa todennut kompetenssien käsittävän ominaisuuksia, jotka ulottuvat organisaation syvärakenteisiin eikä pelkästään näkyvään osaamiseen. Kompetenssit ovat mitattuja kyvykkyyksiä, joita mittausten perusteella parannetaan systemaattisesti (Kesti 2005). Hiljaiset signaalit voidaan ajatella organisaation kyvykkyyksien kehittämismittareina, joiden avulla parannetaan henkilöstöriippuvaisia organisaation kompetensseja (esim. Spencer & Spencer 1993).

Laajan työtyytyväisyyskyselyn mukaan parhaiten tuottavissa organisaatioissa on korkein työtyytyväisyys (Buckingham & Coffman 1999). Toinen selvityksen löydös oli, että työtyytyväisyyteen vaikuttaa eniten oma työyhteisö ja sen esimies. Toisaalta Bassett (1994) toteaa, että paradigma tyytyväinen työntekijä on tuottava työntekijä, ei toimi, vaan kyseessä on paljon tätä yleistystä monimutkaisempi ilmiö. Työtyytyväisyys vaikuttaisi kuitenkin olevan edellytys korkeaan motivaatioon ja suorituskykyyn (Becker & Huselid 1998; Gibson ym. 2003).

Organisaation eri osille sopivien kehittämistoimenpiteiden selvittäminen ja toteuttaminen perinteisillä konsultointimenetelmillä kuten haastattelut, ryhmätyöt ja aivoriihet ovat liian työläitä (Hayes 2002). Koska kaikki työntekijät ovat tietotyöläisiä, pitäisi kehittäminen ulottaa kaikkiin työntekijöihin, jolloin saavutetaan merkittävä vipuvaikutus tuottavuuden kehittymisessä. Työntekijän näkemyksiä hyödyntävät perinteiset ilmapiirikartoitukset ovat liian yleisluontoisia ja nostavat esiin ongelmia, mutta eivät ohjaa niiden ratkaisemiseen. Johtaminen vaikeutuu ja voi ajautua henkilöiden välisiin konflikteihin, mikäli korjaavien toimenpiteiden sopimisesta ei päästä yksimielisyyteen (Minzberg 1991; Hansen ym. 1999). Jos ongelmien ratkaisemiseen valitaan väärät toimenpiteet, voivat ongelmat pahentua entisestään. Esimerkiksi esimiehen päivittäisjohtamisessa esiintyvä ongelma voi johtua siitä, että esimies ei ole riittävästi läsnä tai siitä, että esimies toimii epäasiallisesti.

Hiljaiset signaalit menetelmässä ei niinkään mi-

tata työtyytyväisyyden tilaa, vaan siinä mitataan kyvykkyyksien kehittämistarvetta toimintaa ohjaavalla asteikolla. Hiljaiset signaalit menetelmän mukaan paras inhimillinen suorituskyky syntyy silloin, kun kyvykkyydet ovat vaatimuksiin nähden kunnossa. Tällöin kyvykkyydessä ei havaita kehittämistarpeita (Kesti ym. 2008). Strategisena henkilöstövoimavaraan ja kyvykkyyksiin liittyvänä oletuksena on, että mikäli suorituskykyyn vaikuttavissa kyvykkyyksissä havaitaan kehittämistarpeita niin henkilöstöperustaista suorituskykyä voi kehittää kyvykkyyksiä tunnistamalla ja parantamalla (mm. Garavan 2007; Lee ym. 2007).

Senge (1990) korostaa, että paras osaaminen syntyy ryhmässä, silloin kun se kykenee kollektiivisesti jakamaan ajatuksia ja kiteyttämään ne toimenpiteiksi. Eli ryhmä kykenee ensinnäkin avoimeen dialogiin, jossa lisätään ongelmaan liittyvää kokonaisnäkemystä ja tietämystä. Toiseksi ryhmän täytyy kyetä neuvottelemaan yhteinen näkemys siitä, millä valituilla toimenpiteillä ongelma ratkaistaan. Oikeiden ongelmien löytäminen on tietenkin avaintekijä, joka vaatii toiminnan ja tavoitteiden reflektointia ja palautteen keräämistä. Sengen (1990) mukaan tavoitteiden mukaisen toiminnan käynnistämisen ja aktivoimisen (reinforcing) lisäksi tarvitaan toimintaa ohjaavaa kehittämispalautetta (balancing feedback). Tämä kyvykkyyden tasapainotilaan ohjaava palaute voi johtaa oppimis- ja kehittämisprosessiin, jossa haluttu kyvykkyys optimoidaan situaatioon sopivaksi ja samalla myös yksilölle itselleen luontuvaksi (Syväjärvi ym. 2007; Neck & Manz 2007).

Argyriksen (1985) tekemän tutkimuksen mukaan ero huipputiimin ja keskivertotiimin välillä on niiden kyvyssä kohdata ja ratkaista ristiriitoja. Ihmiset rakentavat luonnostaan suojautumismekanismeja ja rutiineja (defensive reasoning), joilla pyritään minimoimaan epäonnistumisen ja häpeän tunteet (Argyris 1985). Ristiriitojen ja ongelmien kyseenalaistaminen estää meitä oppimasta. Senge (1990) kuvaa tätä niin, että voimakkaat suojautumismekanismit tukkivat ryhmän energiavirran, joka voisi muuten johtaa ratkaisuihin ja yhteiseen oppimiseen. Sisäinen kilpailu voi johtaa osaoptimointiin, jolloin tuloksena on kokonaisuuden kannalta tärkeän tiedon panttaaminen ja kyvyttömyys hallita vaadittavia kokonaisuuksia. Tämä voi aiheuttaa työmoraaliin rapautumista, johdon luottamuksen puutetta sekä tuottavuuden laskua (Gretton 1993).

Muutospaineessa olevassa työyhteisössä luova jännite muodostaa erilaisia ristiriitoja, joissa on energiaa. Ristiriidat ovat siten hyvä asia, joka mahdollistaa toivotun kehittymisen. Avaintekijänä on ristiriitojen rakentava käsittely. Jos ristiriidat kyetään käsittelemään ja ratkaisemaan, jolloin sovittujen toimenpiteiden toteutumisen myötä syntyy onnistumisen elämyksiä, lisääntyy ryhmän intoenergia. Vastaavasti jos ryhmä ei kykene tunnistamaan piileviä ristiriitoja tai niitä vähätellään voi ristiriidoissa oleva negatiivinen energia patoutua organisaatioon negatiivisella tavalla (vrt. Gibson ym. 2003). Mikäli näitä ratkaisemattomia ristiriitoja on liikaa, purkautuu niihin latautunut negatiivinen energia yleensä esimerkiksi henkilöiden välisinä konflikteina, joka syö ryhmän tuottavuutta. Goleman (1998) on todennut, että tuottavuudessa voi olla jopa 12-kertainen ero parhaiten ja heikoiten tuottavien työntekijöiden välillä, kun tehtävät ovat kohtuullisen vaativia. Usein tämä ero näkyy ryhmän kyvyssä innovoida uusia ratkaisuja, joilla parannetaan laatua, asiakastyytyväisyyttä ja kilpailukykyä.

Goleman (1998) tutkimukset huipputuottavista ryhmistä osoittavat, että samalla osaamistasolla olevien työyhteisöjen erot tuottavuudessa johtuvat niiden kyvyissä onnistua emotionaalisen älykkyyden hyödyntämisessä käytännössä. Tällöin ne ovat onnistuneet seuraavissa tekijöissä:

- hyvä tilannetaju toiminnasta, joka ohjaa päätöksentekoa.
- tieto omista kyvyistä ja hyvä perusta terveelle itsetunnolle.
- ristiriitojen rakentava käsittely, jossa työntekijöiden näkemyksiä arvostetaan ja otetaan huomioon, kun edetään yhteisiin tavoitteisiin.
- hyvä ryhmähenki, jossa hyväksytään erilaiset yksilöt voimavarana
- vuorovaikutteinen ja valmentava esimiestoiminta

Emotionaalinen älykkyys käsittää ihmiskeskeisiä taitoja, joita esimerkiksi ovat itsetunto, itsekuri, motivaatio, empatia sekä sosiaaliset taidot (mm. Salovery & Meyer 1990; Spencer & Spencer 1993; Syväjärvi & Stenvall 2003). Voidaankin perustellusti olettaa, että emotionaalista älykkyyttä voidaan parhaiten kehittää rakentavassa sosiaalisessa vuorovaikutuksessa ryhmässä, sen jäsenten kollektiivisen hiljaisen tiedon perusteella. Tässä yhteydessä myös organisaatioelämän kokemuksilla on merkityksensä.

Koska oman toiminnan parhaita asiantuntijoita ovat organisaatiossa työskentelevät ihmiset, joilla

on toivotun muutoksen sujuvaan toteuttamiseen tarvittava hiljainen tieto, on jokaisen työntekijän näkemysten huomioiminen oleellisen tärkeää (Nonaka & Takeuchi 1995). Nonaka & Konno (1998) kuvaavat prosessin, joka vaiheittain jalostaa ryhmän hiljaisen tiedon näkyväksi osaamiseksi. Siinä hiljaisen tiedon jalostuminen käytäntöön tapahtuu sosiaalisen vuorovaikutuksen avulla (sosialisaation, ulkoistaminen, yhdistäminen, sisäistäminen). Bredekamp & Rosegrant (1992) kuvaavat uuden tiedon synnyttämisen vaiheina, jossa tietoisuuden herääminen johtaa tutkimiseen, jonka myötä tietoja vertaillaan sosiaalisessa vuorovaikutuksessa, jolloin parhaat ideat jalostuvat käytäntöön sovellettaviksi.

Merkityksellisiä HRIS menetelmän myötä syntyviä etuja ovat myös henkilön omat tuntemukset ja tiedot kyvykkyyksistään. Tällöin edellytykset toimia tuottavammin ja kyvykkäämmin parantuvat (vrt. Neck & Manz 2007). Hiljaisiin signaaleihin perustuva HRIS tarjoaa organisaation kehittämiseen henkilöstön näkemyksen, jonka tavoitteena on kyvykkyyksien monitasoinen kehittäminen. Delany (2001) mukaan henkilöstön näkemykset pitää saada ohjaamaan päätöksentekoa, yhtä tärkeänä tekijänä kuin taloudelliset ennusteet. Organisaation kehittäminen vaatii henkilöstön näkemysten huomioimista siten, että yksilöt ja työyhteisöt voivat parantaa toimintaansa (Maier ym. 2001). Yksilö- ja työyhteisötasolla tapahtuva käyttäytymisen rakentava ja monitahoinen muutos aikaansaa koko organisaatiota koskevan kehittymisen (Pilbeam & Corbridge 2002). Tulokset näkyvät organisaation henkilöstötuottavuuden tunnusluvuissa kuten myynnin kehityksessä ja HCROI luvussa (mm. Fitz-enz 2000).

Tutkimustulokset

Kyvykkyyksien kehittämiskyselyt valmisteltiin organisaation johdon kanssa (HRIS valmistelu) vuoden 2005 lopulla. Ensimmäinen kyvykkyyksien kehittämismittaus (HRIS mittaus) toteutettiin jokaisessa organisaation yksikössä vuoden 2005–2006 vaihteessa (1. mittaus) ja toinen kehittämiskysely vuoden 2006–2007 vaihteessa (2. mittaus). Kysely tehtiin sähköisenä ja ajoitettuna niin, että jokaisella yksiköllä oli 2 viikkoa vastausaikaa. Ensimmäisessä mittauksessa keskimääräinen vastausprosentti kaikkiin kyselyihin oli 57 % ja toisessa 48 %. Kirjoitettuja kommentteja laadullisena aineistona tuli molemmilla mittauskerroilla lähes 1500 kappaletta. Kyvykkyyksiä mitattiin yrityksessä neljällä eri kyvykkyyden osa-alueella: asiakaspalveluosaaminen, esimiestoiminta, toimintakulttuuri ja tiedottaminen. Tulokset analysoitiin johdon kanssa (HRIS analysointi) välittömästi mittauksen jälkeen ja samalla sovittiin kunkin yksikön kehittämispalaverin ajankohta (HRIS kehittäminen).

Taulukko 1. Tutkittavan organisaation kyvykkyyksien mittaukset kokonaisuutena.

	1. mittaus	suurin ero	2. mittaus	suurin ero
Asiakaspalveluosaaminen	88 %	9 %	88 %	8 %
Esimiestoiminta	78 %	23 %	80 %	16 %
Toimintakulttuuri	81 %	23 %	82 %	21 %
Tiedottaminen	85 %	20 %	87 %	15 %

Taulukon 1 kyvykkyyksien prosenttiluvut (mittaus 1 ja 2) saadaan hiljaiset signaalit mittauksesta, jolloin ne kuvaavat henkilöstön kokemaa kyvykkyyden tasoa eli kompetenssia asteikolla 0 – 100 % (Kesti ym. 2008). Suurin ero kertoo keskimääräisten kompetenssien suurimman eron eri yksiköiden välillä. Tiedottamista koskevassa kyselyssä mitattiin kehittämistarpeita, jotka liittyivät muutosviestintään ja tiedottamiseen. Tiedottamisen kyvykkyyttä parannettiin strategisina toimenpiteitä, joilla lisättiin sekä tiedottavaa viestintää että ryhmissä tehtävää vuorovaikutusviestintää. Suurimmat parannukset (noin 7 %) tapahtuivat muutoksiin liittyvässä tiedottamisessa sekä johtoryhmän tiedottamisessa henkilöstöä koskevissa päätöksissä. Asiakaspalveluosaamisessa yksilöt arvioivat oman osaamisensa kehittämistarpeita. Mittauksessa omassa asiakaspalveluosaamisessa ei havaittu merkittäviä kehittämistarpeita ja myös tulosyksiköiden väliset erot olivat vähäiset.

Ryhmissä lähdettiin kehittämään kyvykkyyksiä, joihin työyhteisöillä koettiin olevan eniten mahdol-

lisuuksia itse vaikuttaa (HRIS kehittäminen). Näiksi kyvykkyyksiksi valittiin esimiestoiminta ja toimintakulttuuri, joihin liittyen toteutettiin kyvykkyyksien kehittämisprosessi. Jokaisessa työyhteisössä tarkasteltiin omia kehittämistarpeita, joihin yhdessä ideoitiin käytännön kehittämistoimenpiteitä. Näistä valittiin toteutettavaksi neljä toimenpidettä, joiden toteutumista seurattiin systemaattisesti (HRIS seuranta).

Mittareina henkilöstötuottavuuden kehittämisen seurannassa olivat seuraavat tunnusluvut:

- Mitatut kyvykkyydet (esimiestoiminta ja toimintakulttuuri)
- Kyvykkyyksien muutos (esimiestoiminta ja toimintakulttuuri)
- Henkilöstötuottavuuden taso (HCROI = myyntikate / henkilöstökulut)
- Henkilöstötuottavuuden muutos (HCROI muutos)
- Henkilöstömäärän muutos (HR-kasvu)

Näillä yksikkökohtaisilla mittareilla haluttiin seurata sekä laadullista että määrällistä henkilöstötuottavuuden kehittymistä. Määrällisinä liiketoiminnan tulosmittareina toimivat HCROI sekä henkilöstömäärän muutos ja laadullisina mittareina kyvykkyydet ja niiden muutos. Näitä mittareita käytettiin sekä yksikkötasolla että koko organisaatiotasolla. Lisäksi seurattiin koko yrityksen liikevaihdon kehitystä.

Taulukko 2. Yhteenveto tuloksista. Yksiköt on laitettu järjestykseen mittauksen 1 kyvykkyyksistä (esimiestoiminta ja toimintakulttuuri) lasketun yhteisen keskiarvon mukaan.

	Esimiestoiminta			Toimintakulttuuri			HCROI	HCROI	HCROI	
	1.mittaus	2.mittaus	Kehitys	1.mittaus	2.mittaus	Kehitys	1.mittaus	2.mittaus	kasvu	HR-kasvu
Yksikkö 1	65,1 %	87,0 %	21,9 %	67,8 %	86,2 %	18,4 %	2,67	2,57	-3,9 %	4 %
Yksikkö 2	66,4 %	73,2 %	6,9 %	67,9 %	68,1 %	0,2 %	2,79	2,77	-0,8 %	12 %
Yksikkö 3	66,7 %	75,6 %	8,9 %	68,0 %	76,4 %	8,4 %	2,87	2,90	1,1 %	13 %
Yksikkö 4	66,6 %	74,5 %	7,9 %	70,6 %	74,8 %	4,2 %	2,71	2,66	-1,7 %	9 %
Yksikkö 5	66,3 %	81,4 %	15,1 %	79,8 %	89,1 %	9,3 %	2,02	2,37	16,9 %	0 %
Yksikkö 6	73,6 %	81,8 %	8,2 %	75,7 %	78,7 %	3,0 %	2,69	2,83	5,0 %	1 %
Yksikkö 7	73,4 %	68,9 %	-4,6 %	78,4 %	75,6 %	-2,8 %	2,98	3,04	2,0 %	22 %
Yksikkö 8	**74,6 %**	**84,1 %**	**9,6 %**	**79,5 %**	**89,1 %**	**9,6 %**	**3,05**	**3,23**	5,9 %	15 %
Yksikkö 9	82,0 %	79,9 %	-2,1 %	78,5 %	80,1 %	1,6 %	2,51	2,51	-0,3 %	9 %
Yksikkö 10	80,6 %	79,4 %	-1,3 %	81,3 %	83,5 %	2,2 %	2,82	2,94	4,1 %	8 %
Yksikkö 11	82,3 %	76,6 %	-5,7 %	80,2 %	78,8 %	-1,4 %	3,24	3,43	5,9 %	4 %
Yksikkö 12	77,9 %	83,2 %	5,3 %	84,5 %	84,1 %	-0,4 %	2,38	2,51	5,4 %	5 %
Yksikkö 13	82,8 %	85,5 %	2,7 %	82,8 %	87,4 %	4,6 %	2,47	2,47	-0,1 %	19 %
Yksikkö 14	79,2 %	78,2 %	-1,0 %	87,8 %	84,0 %	-3,8 %	1,77	2,11	19,2 %	7 %
Yksikkö 15	82,6 %	81,1 %	-1,6 %	85,4 %	84,3 %	-1,1 %	2,55	2,49	-2,3 %	6 %
Yksikkö 16	84,5 %	82,6 %	-1,9 %	87,0 %	86,3 %	-0,7 %	3,21	3,45	7,5 %	12 %
Yksikkö 17	88,4 %	85,1 %	-3,2 %	86,2 %	83,5 %	-2,7 %	1,75	2,05	17,5 %	13 %
Yksikkö 18	87,6 %	77,3 %	-10,4 %	89,7 %	79,9 %	-9,8 %	2,82	2,84	0,7 %	18 %
Yksikkö 19	87,9 %	78,3 %	-9,6 %	89,6 %	82,1 %	-7,5 %	1,91	2,21	15,7 %	20 %
Yksikkö 20	87,6 %	89,3 %	1,6 %	90,8 %	84,9 %	-5,9 %	3,35	3,45	3,0 %	15 %
KA	**77,8 %**	**80,1 %**	**3,0 %**	**80,6 %**	**81,8 %**	**1,6 %**	**2,63**	**2,74**	4,3 %	10 %

Seuraavassa taulukossa on jaettu kaikki yksiköt kahtia keskimääräisten kyvykkyyksien mukaan. Lisäksi taulukossa tarkastellaan yksiköitä, joissa keskimääräiset kyvykkyydet ovat alle valitun hälytysrajan (70 %), näitä yksiköitä oli neljä. Vastaavasti parhaita kyvykkyyksiä edustavia yksiköitä oli viisi, joissa keskimääräiset kyvykkyydet olivat yli 85 %.

Taulukko 3. Esimiestoiminnan ja toimintakulttuurin keskimääräisten kyvykkyyksien vaikutus tuottavuuteen.

		HCROI alku	HCROI loppu	HCROI kasvu	HR-kasvu	Keskim. kyvykkyydet lähtötaso	kyvykkyyksien muutos
Kyvykkyydet 81% tai alle	10 kpl	2,71	2,78	3 %	9 %	73 %	6 %
Kyvykkyydet yli 81%	10 kpl	2,55	2,70	7 %	12 %	85 %	-3 %
Kyvykkyydet alle 70 %	4 kpl	2,76	2,72	-1 %	9 %	67 %	10 %
Kyvykkyydet yli 85 %	5 kpl	2,61	2,80	9 %	16 %	88 %	-5 %

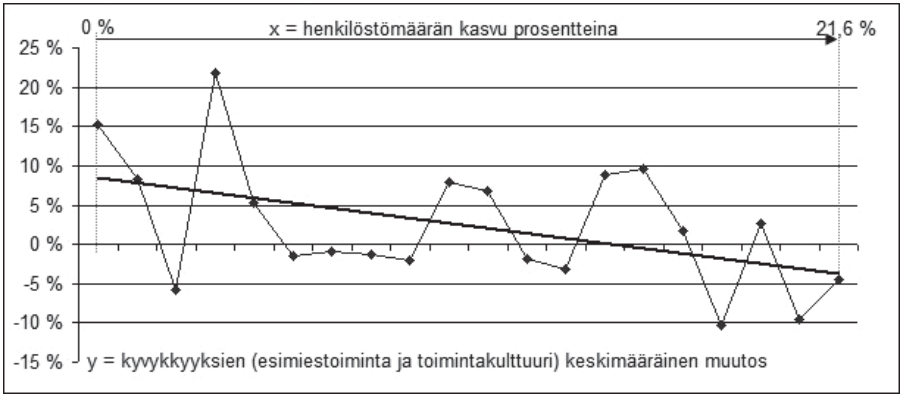
Yksiköt, joilla esimiestoiminnan ja toimintakulttuurin keskimääräiset kyvykkyydet ovat paremmat, ovat lisänneet tuottavuutta enemmän kuin muut. Tämä siitäkin huolimatta, että niiden henkilöstömäärän kasvu on ollut muita yksiköitä suurempi. Henkilöstömäärän kasvu näyttää nostavan kyvykkyyksien kehittämistarpeita, jolloin kyvykkyydet laskevat, kuten kuvan 1 trendiviiva osoittaa.

Kohdeyrityksen toimialan keskimääräinen HCROI oli tilastokeskuksen tilinpäätöstietojen mukaan 2,58 (StatFin-tilastopalvelu). Kohdeyrityksen HCROI oli tutkimusvuoden alussa 2,63 ja lopussa 2,74 eli 4,3 % parannus. Tuottavuuden nousun lisäksi henkilöstömäärä on lisääntynyt noin 10 % ja liikevaihto on kasvanut 3,5 %.

Esimiestoiminnan ja toimintakulttuurin kyvykkyyksiä kehitettiin samassa yhteydessä organisaation jokaisessa työyhteisössä vuorollaan. Tarkastellaan tarkemmin esimiestoiminnan kyvykkyyden kehittämismittauksia. Koko organisaatiossa esimiestoiminnassa havaittiin eniten kehittämistarpeita seuraavissa ominaisuuksissa:

- kannustavan palautteen antaminen henkilöstölle
- muun ketjuohjauksen tuki työhösi
- muutosten ja kehityksen edistäminen työyhteisössä
- toimintatavat ongelmien ja ristiriitojen ratkaisemiseen

Kannustavan palautteen antamista voidaan edistää esimiesvalmennuksella samoin kuin toimintatapoja ongelmien ja ristiriitojen ratkaisemiseen. Kyvykkyyksien kehittämisprosessi itsessään paran-



Kuva 1. Henkilöstömäärän kasvun vaikutus esimiestoiminnan ja toimintakulttuurin yhteenlaskettuun keskimääräiseen kyvykkyyteen.

taa näitä molempia asioita antamalla esimiehille mahdollisuuden rakentavaan ongelmien käsittelyyn ja ratkaisemiseen positiivisessa hengessä. Kehittämisprosessi toteutetaan ketjuohjattuna, osana organisaation muutoksen ja kehityksen edistämistä. Vaikuttaa siis siltä, että kyvykkyyksien kehittämisprosessi vastaa hyvin organisaatiossa esiintyviin tarpeisiin.

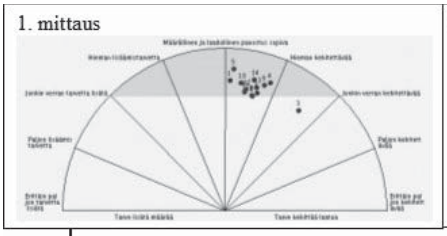
Taulukko 4. Esimiestoiminnan kyvykkyyksien mittaukset organisaatiotasolla.

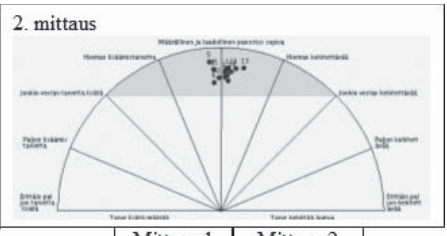
Arvioitava asia	1. mittaus	2. mittaus	ERO
1. Esimiehen tuki työhösi	**79,6 %**	**82,6 %**	3,1 %
2. Keskusvaraston tuki työhösi	**78,9 %**	**81,3 %**	2,4 %
3. Muun ketjuohjauksen tuki työhösi	**74,2 %**	**77,4 %**	3,2 %
4. Vastuiden ja velvoitteiden määrittely	**81,6 %**	**82,1 %**	0,5 %
5. Tiedottaminen yksikkösi tavoitteista ja tuloksista	**87,2 %**	**89,5 %**	2,3 %
6. Kehityskeskustelut	**76,6 %**	**77,2 %**	0,6 %
7. Kannustaminen omaehtoiseen kehittämiseen	**76,2 %**	**79,1 %**	2,9 %
8. Kannustavan palautteen antaminen henkilöstölle	**69,1 %**	**73,3 %**	4,3 %
9. Palautteen vastaanottaminen	**81,4 %**	**82,8 %**	1,5 %
10. Rakentavan ja hyvän yhteistyön edistäminen	**77,1 %**	**79,3 %**	2,2 %
11. Muutosten ja kehitysten edistäminen työyhteisössä	**75,2 %**	**79,4 %**	4,2 %
12. Tiedottaminen ja tiedon jakaminen	**77,8 %**	**80,3 %**	2,6 %
13. Ongelmien ratkaiseminen	**76,6 %**	**79,4 %**	2,8 %
14. Esimerkillisyyden osoittaminen	**78,2 %**	**78,7 %**	0,5 %
KA	**77,8 %**	**80,1 %**	2,3 %

Taulukossa näkyy esimiestoiminnan kyvykkyyksien mittaukset koko organisaatiotasolla, näitä ylätason tuloksia hyödynnetään strategisessa HRIS johtamisessa. Jokaisessa työyhteisössä on omat kehittämistarpeet, jotka voivat poiketa koko organisaation keskimääräisistä tuloksista. Optimaalisen organisaation kehittämisen kannalta onkin tärkeää, että työyhteisöt pureutuvat kehittämisasioihin, jotka vaativat ensisijaista huomiota oman toiminnan kehittämiseksi. Strategisella tasolla luodaan edellytyksiä ja valitaan kehittämisen painopisteitä, työyhteisökohtaisella tasolla parannetaan konkreettisia asioita, jotka ryhmä itse voi laittaa kuntoon.

Tarkastellaan lähemmin yksikköä 8 (kts. taulukko 2), jonka henkilöstömäärä on kasvanut 15 % ja henkilöstötuottavuus (HCROI) on parantunut 5.6 %, vaikka se oli jo lähtökohdin huipputasolla (3.05). Kyvykkyyksien kehittämisen myötä myös kyvykkyydet ovat parantuneet merkittävästi.

Taulukko 5. Esimiestoiminnan kehittämismittaukset





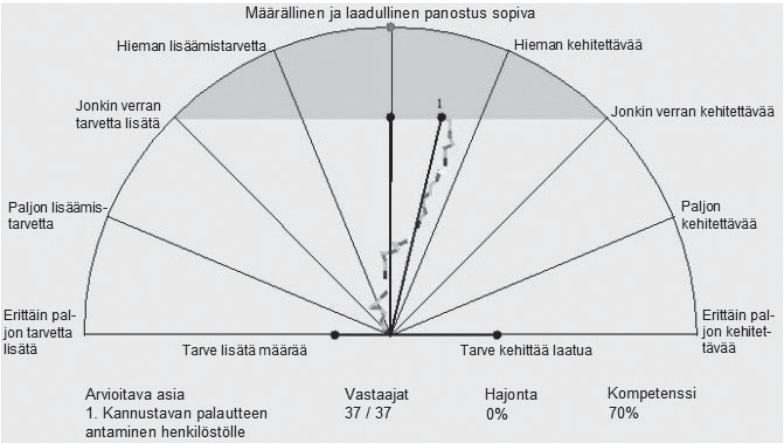
Arvioitava asia	Mittaus 1 Kompetenssi	Mittaus 2 Kompetenssi
1. Esimiehen tuki työhösi	80%	85%
2. Keskusvaraston tuki työhösi	70%	81%
3. Muun ketjuohjauksen tuki työhösi	61%	81%
4. Vastuiden ja velvoitteiden määrittely	78%	82%
5. Tiedottaminen yksikkösi tavoitteista ja tuloksista	87%	91%
6. Kehityskeskustelut	72%	78%
7. Kannustaminen omaehtoiseen kehittämiseen	70%	86%
8. Kannustavan palautteen antaminen henkilöstölle	70%	79%
9. Palautteen vastaanottaminen	77%	87%
10. Rakentavan ja hyvän yhteistyön edistäminen	78%	85%
11. Muutosten ja kehitysten edistäminen työyhteisössä	72%	86%
12. Tiedottaminen ja tiedon jakaminen	74%	87%
13. Ongelmien ratkaiseminen	75%	87%
14. Esimerkillisyyden osoittaminen	80%	83%
	75%	84%

Taulukossa ja kehitysviuhkoissa näkyy miten kyvykkyydet ovat tässä yksikössä parantuneet kehittämisprosessin myötä. Kehitysviuhkan yläosassa on tummennettuna valitun 70 % hälytysrajan ylittävä alue. Kehittämisprosessin jälkeen tehdyssä mittauksessa kaikki esimiestoiminnan kyvykkyyden ominaisuudet ovat hälytysrajan paremmalla puolella.

Seuraavassa kuvassa on tarkempi kehitysviuhka esimiestoiminnan kyvykkyydestä 8:

Seuraavassa kuvassa on tarkempi analyysi 1. mittauksen kyvykkyyden ominaisuudesta: Kannustavan palautteen antaminen henkilöstölle.

Määrällinen ja laadullinen panostus sopiva



Kuva 2. Tarkempi ryhmäkohtainen analyysi kannustavan palautteen antamisesta henkilöstölle.

Tarkemmassa ryhmäkohtaisessa analyysissä on kukin kehittämisnäkemys kuvattu mielipidejanalla. Kehittämisprosessin kannalta on mielenkiintoista nähdä mahdolliset jyrkät näkemyserot. Näkemyserot ovat suuret silloin, kun osa kokee kaiken olevan kunnossa (jana suoraan ylöspäin) ja osa kokee erittäin paljon määrällistä lisäämistarvetta tai laadullista kehittämistarvetta. Kehittämistarvetta ilmaisevien mielipidejanojen yhteenlaskettu summa kertoo ryhmän kollektiivisen kehittämistarpeen. Määrällinen kehittäminen on helpompaa kuin laadullinen kehittäminen, joka vaatii yleensä poisoppimista vallitsevasta toimintatavasta.

Seuraavassa on kaksi laadullista lainausta kannustavan palautteen kehittämiseen:

> *En ole saanut minkäänlaista palautetta*
> *Jotain muutakin kannustinta voisi käyttää kun BONUS, mitä hehkutetaan 10 kuukautta vuodessa. Ja sitten kun olisi aika kuulla bonuksista jotain, niin 2 kuukautta selitellään, että ei olla vielä saatu laskelmia valmiiksi tai jotain muuta millä väistellään sanomasta suoraa ettei sellaisia tule.*

Koska ryhmä oli melko suuri, pidettiin kehittämispalaveri (HRIS kehittäminen) kahdessa ryhmässä, joissa mittauksen tulosten perusteella ideoitiin 23 konkreettista kehittämistoimenpidettä. Näistä jokainen valitsi neljä tärkeintä, jonka jälkeen yhdessä esimiehen kanssa priorisoitiin neljä toimenpidettä toteutukseen. Ideat, joita ei valittu toteutukseen, kirjattiin ryhmän ideapankkiin ja toteutukseen valituille sovittiin aikataulu ja seuranta. Valitut toimenpiteet laitettiin näkyville myös työyhteisön ilmoitustaululle.

Yksikön johto ja esimiehet ovat suhtautuneet kehittämistoimintaan asiaan kuuluvalla innolla, kuten seuraava johdon laadullinen lainaus osoittaa:

> *Asiat, jotka laitoimme paperille, on koko vuoden projekti ja ennen kaikkea esimiestyön parantamista sekä asioiden käsittelyä henkilökohtaisella tasolla (naamat vastakkain). Etenemme järjestelmällisesti ja henkilöstön motivaatiota "ruokitaan" koko ajan.*

Seurannassa johto korosti asioiden järjestelmällistä parantamista ja henkilöstön motivaation ruokkimista koko ajan. Myös esimiestyötä parannettiin ja asioita uskallettiin käsitellä enemmän myös henkilökohtaisella tasolla.

Seurannassa neljän kuukauden kuluttua oli toteutunut seuraavia asioita:

- Sähköpostiosoitteet on saatu kaikille.
- Tuotekoulutusta on järjestetty.
- Aluevastaavapalavereja on alettu pitämään 2–3 viikon välein, joista pöytäkirjat jaetaan muulle henkilöstölle.
- Työvälineitä on uudistettu.

Jokaisessa yksikössä toteutettiin vastaava kyvykkyyksien kehittämisprosessi, joka johti konkreettisiin parantaviin toimenpiteisiin minimaalisella kehittämiseen käytetyllä työajalla. Kehittämisprosessissa työntekijöiden aikaa kuluu noin kolme tuntia optimaalisten käytännön toimenpiteiden sopimiseen. Tästä ajasta käytetään puoli tuntia sähköiseen hiljaiset signaalit mittaukseen ja noin 2,5 tuntia ryhmätyöhön, jossa tulosten perusteella ideoidaan ja valitaan toteutettavat optimaaliset toimenpiteet. Tämän jälkeen seuraa sovittujen toimenpiteiden toteuttaminen, joiden seuranta jää pääosiltaan esimiesten vastuulle. Toimintatutkimuksessa tähän vaiheeseen vaikutettiin pelkästään seurantasoitoilla tai seurantakäynneillä. Systemaattista organisaation kehittymistä kuvaa hyvin seuraava johdolta saatu laadullinen lainaus:

> *Positiivinen asia on huomata henkilöstön yrittävän parantaa omaa tekemistään, osallistuen oman työpaikkansa kehittämiseen. Ongelmat tuodaan jo osittain ratkaisumallin kanssa. Omatoiminen kehittäminen on tuonut positiivista asiakaspalautetta, mikä näkyy myös tuloksissa.*

Johtopäätökset

Tutkimustehtävinä oli selvittää miten organisaation kyvykkyyksien kehittyminen kytkeytyy henkilöstötuottavuuteen ja toisaalta miten organisaatioita voidaan systemaattisesti kehittää hiljaiset signaalit HRIS avulla? Tutkimusorganisaatiossa oli toteutettu ennen mittausta merkittävä asiakaspalveluosaamisen koulutushanke, joka osaltaan saattoi vaikuttaa siihen, että asiakaspalveluosaamisessa ei koettu merkittäviä kehittämistarpeita. Eniten kehittämistarpeita koettiin esimiestoiminnan ja toimintakulttuurin kehittämisessä, jotka ovatkin merkittävimpiä yhteisöllisiä työhyvinvoinnin ja tuottavuuden tekijöitä (vrt. Goleman 1998, Fitz-enz 2000, Buckingham & Coffman 1999), muodostaen edellytykset organisaation oppimiselle.

Esimiestoiminnan ja toimintakulttuurin kyvykkyydet näyttävät korreloivan vahvasti yksiköiden menestymisen kanssa. Tutkimus osoittaa, että näitä yhteisöllisiä kyvykkyyksiä voidaan tunnistaa ja parantaa hiljaiset signaalit HRIS menetelmällä, jossa jokaisessa työyhteisössä sovitaan toimenpiteet mittauksen tulosten perusteella. Tämä prosessi vastaa hyvin aikaisemmin esitettyä tietotaidon kehittämisen teoriaa (vrt. Bredekamp & Rosegrant 1992; Nonaka & Takeuchi 1995). Kyvykkyyksien kehittyminen näyttää riippuvan myös vahvasti siitä, miten voimakkaan muutoksen kohteena työyhteisö on kehittämisen aikana. Yhteisöllisyys kehittyy ensisijaisesti ryhmässä, jolloin kehittyminen hidastuu, jos ryhmän kokoonpano muuttuu. Kohdeorganisaatiossa suurin työyhteisöjä koskeva muutos on aiheutunut henkilöstömäärän kasvusta, mikä näkyy eniten henkilöstömäärää kasvattaneiden yksiköjen kyvykkyyksien laskuna.

Työyhteisön työntekijät tietävät parhaiten mitkä toimenpiteet auttavat omaan työhön ja työyhteisön tilanteeseen. Henkilöstö näyttää omaavan hiljaista tietoa siitä, mitkä tekijät pitää ensisijaisesti saada kuntoon, että työhyvinvointia ja tuottavuutta voidaan lisätä. Kun tarkastellaan yksikköjä tarkemmin, havaitaan kehittämistarpeissa jonkin verran hajontaa ja kun lisäksi otetaan huomioon varsinaiset käytännön toimenpiteet, ei kukaan työyhteisöön perehtymätön voi aavistaa oikeita parhaiten toimivia kehittämistoimenpiteitä. Vaikka joku onnistuisikin arvaamaan valittavat toimenpiteet oikein, eivät työntekijät niitä hyväksy, jos he eivät itse ole olleet niitä ideoimassa ja valitsemassa. Joissakin yksiköissä kuuli esimiesten sanovan, että nyt saatiin korjattua asioita, joita on yritetty laittaa kuntoon jo aiemminkin. Henkilöstön näkemyksiä kuunteleva ja kehittämiseen osallistava prosessi näyttää olevan tärkeää muutokseen sitouttamisen kannalta.

Esimiestoiminnan ja toimintakulttuurin kyvykkyyksillä vaikuttaa olevan suuri merkitys työyhteisön toimintaan, muodostaen tekijöitä, joita Goleman (1998) korostaa erityisen tärkeinä emotionaalisen kollektiivisen älykkyyden luomisessa. Tutkimus osoittaa, että hiljaisiin signaaleihin perustuva HRIS auttaa henkilöstön kyvykkyyksien kehittämistarpeiden tunnistamista ja luo edellytykset kyvykkyyksien kehittämiselle. Kyvykkyydet ovat parantuneet kaikissa yksiköissä, joissa mitatut kyvykkyydet olivat alle valitun 70 % hälytysrajan. Tutkimuksessa vahvistui käsitys, että hiljaiset signaalit mittauksen hälytysrajaksi sopii valittu 70 % raja. Kun 70 % hälytysraja ylitetään, niin kehittämisideoinneissa nousevat enemmän esille käytännön työn tekemiseen liittyvät parannukset. Havainnot kokonaisuudessaan osoittavat, että HRIS voi aidosti olla osana paitsi henkilöstön kyvykkyyksien kartoittamista niin myös johdon tietojärjestelmänä tukemassa henkilöstölähtöistä kehittämisprosessia. Tutkimushavaintojemme mukaan on osoitettavissa, että HRIS luo osaltaan tarpeellista näyttö- ja tosiasiatietoa henkilöstön kehittämisprosesseihin.

Vaikuttaa siltä, että työyhteisöjen hyvä esimiestoiminta ja yhteistyö mahdollistavat uusien työntekijöiden nopeamman perehtymisen, jolloin henkilöstöinvestoinnin takaisinmaksuaika on nopeampi. Toimintatutkimus näyttää vahvistavan Golemanin (1998) tutkimuksia, joissa emotionaalisesti kyvykkäämmät yhteisöt pystyvät kehittymään paremmin ja tekemään parempaa tulosta. Koko yrityksessä on osaajien saaminen ollut haasteellista. Tutkimuksen tulokset voitaisiin tulkita myös niin, että hyvin toimivien työyhteisöjen on ollut helpompi saada uusia hyviä osaajia kuin muiden.

Henkilöstömäärän kasvu nostaa etenkin esimiestoiminnan ja toimintakulttuurin kyvykkyyksiltä vaadittavaa tasoa, jolloin mittauksessa nousee kehittämistarpeita voimakkaammin esille. Työyhteisöt, joissa henkilöstömäärän kasvu on yli 15 % vuodessa, eivät ole kyenneet pitämään samaa kyvykkyyksien tasoa kehittämisprosessista huolimatta. Kyvykkäimmät yksiköt ovat kuitenkin pystyneet henkilöstömäärän kasvusta huolimatta jatkuvasti parantamaan henkilöstötuottavuutta (HCROI). Tämä indikaattori näyttää toimivan hyvin yrityksissä, sillä henkilöstö voi kyvykkyyksiä parantamalla lisätä indikaattorin osoittajaa ja vähentää sen nimittäjää.

Sellaiset työyhteisöt, joissa esimiestoiminnan ja toimintakulttuurin kyvykkyydet ovat olleet alle 70 % rajan, ovat hyötyneet erityisen paljon kollektiivisesta kyvykkyyksien kehittämisestä. Näissä eniten kehittämistä kaipaavissa työyhteisöissä on ollut paljon henkilöstölähtöisiä ristiriitoja, jolloin kehittämispalavereissa on pureuduttu toimenpiteisiin ja pelisääntöihin, joilla parannetaan työyhteisön rakentavaa vuorovaikutusta ja kehittymisen edellytyksiä. Yhdessä sovituilla pelisäännöillä, kuten tervehtiminen, asiallinen käytös ja toisten huomioiminen, näyttää tällöin olevan suuri vaikutus kyvykkyyksiin. Kollektiivinen ristiriitojen käsittely näyttää vahvistavan Argyriksen (1985) tutkimusta, että ero huipputiimin ja keskivertotiimin välillä on niiden kyvyssä kohdata ja ratkaista ristiriitoja.

Tutkimus puoltaa Pilbeam ja Corbridgen (2002) näkemystä, että suurenkin organisaation kehittyminen muodostuu näistä pienistä työyhteisökohtaisista askeleista. Nämä pieniltä vaikuttavat konkreettiset toimenpiteet ja asennemuutos aikaansaavat suuren vipuvaikutuksen, joka näkyy myös tutkittavassa organisaatiossa. Tavoitteiden saavuttamisessa on pienillä työyhteisökohtaisilla oikean suuntaisilla askeleilla erittäin suuri merkitys. Tutkimustulokset viittaavat siihen, että yrityksen investointi henkilöstön kasvuun on kannattavampaa niissä organisaation osissa, joissa kyvykkyydet ovat kunnossa. Tutkimuksemme näyttää tukevan Buckinghamin ja Coffmanin (1999) löydöstä, että työyhteisön ja esimiehen toiminta on ratkaisevaa, siinä miten tyytyväisiä ja tuottavia työntekijät ovat.

Henkilöstötuottavuuden liiketaloudelliseen seurantaan sopivat tutkimustapauksessa myynti, myyntikate, henkilöstökulut sekä henkilöstömäärän muutos. Näistä saadaan henkilöstötuottavuuden indeksi HCROI, joka kertoo henkilöstötuottavuuden kehittymisen. Henkilöstömäärän kasvattaminen on investointi tulevaisuuteen, sillä uudet työntekijät aiheuttavat aluksi enemmän menoja kuin tuloja.

Organisaation esimiestoiminnan ja toimintakulttuurin kyvykkyyksillä näyttää tutkimuksen mukaan olevan selkeä kytkentä henkilöstötuottavuuteen (HCROI) ja sen parantamiseen. Koska nämä kyvykkyydet voidaan mitata ja niitä voidaan kehittää mittauksen perusteella, soveltuvat ne Balance Scorecard kasvun ja kehittymisen näkökulmaan (vrt. Kaplan & Norton 1996). Ne työyhteisöt, joissa kyvykkyydet olivat korkealla tasolla, näyttivät kykenevän perehdyttämään uudet työntekijät merkittävästi keskivertoa paremmin, sillä niissä parannettiin samalla henkilöstötuottavuutta.

Hiljaiset signaalit HRIS järjestelmän ja henkilöstön kehittämisprosessin ansiosta pystyttiin tällä kehittämispanoksella aikaansaamaan henkilöstötuottavuuden parantuminen. Kehittämistä ei koettu liikaa aikaa vieväksi toiminnaksi suhteessa saavutettaviin tuloksiin, kuten konsultointipainotteisissa kehittämishankkeissa saatetaan kokea (Ylöstalo 2005). Organisaation oma kehittämiseen käytetty työaika oli investointi, joka tässä tutkimustapauksessa on maksanut itsensä takaisin nopeasti ja moninkertaisesti.

Hiljaiset signaalit HRIS avulla saatiin tärkeisiin kyvykkyyksiin liittyvät kehittämistarpeet ja -ajatukset mitattua toimintaan ohjaavalla tavalla. Näin voitiin tehokkaasti käsitellä esiin nousseet ristiriidat ratkaisukeskeisesti ja sopia käytännön kehittämistoimenpiteet. Kyvykkyyksien kehittämiseen liittyvää organisaation hiljaista tietoa voitiin käyttää hyödyksi strategisessa päätöksenteossa, jossa valittiin organisaation kehittämisen painopistealueita ja tarvittavia investointeja. Mittauksen perusteella käynnistettiin kussakin työyhteisössä noin neljä yhdessä ideoitua ja valittua kehittämistoimenpidettä. Yhteinen ristiriitojen käsittely, sopiminen ja toimenpiteiden toteuttaminen vaikuttivat positiivisesti työyhteisöjen emotionaaliseen älykkyyteen.

Toimintatutkimusvuoden kuluessa työyhteisöis-

sä mitatut kyvykkyydet paranivat 2,3 %, henkilöstötuottavuus (HCROI) parani 4,3 %, liikevaihto lisääntyi 3,5 % ja kokonaishenkilöstömäärä kasvoi noin 10 %. Organisaatio on kasvanut sekä liikevaihdossa että henkilöstömäärässä mitattuna ja samanaikaisesti parantanut merkittävästi henkilöstötuottavuutta. Voidaan siis todeta, että systemaattisesti johdetulla ja koko henkilöstöä koskevalla kyvykkyyksien parantamisella aikaansaatiin koko organisaation kehittyminen.

Tutkimuksessa nousi kehittämistarpeina esille sovittujen toimenpiteiden toteutumisen seurannan systematisointi HRIS apuvälineillä. Suuressa organisaatiossa seurannan järjestäminen toimenpiteiden toteutumisen kontrolloimiseksi on melko työlästä. Osassa työyhteisöissä kehittäminen ei tarvitse tukipalveluja, mutta suurin osa kaipaa niitä. Kehittämistä ei siten voi jättää pelkästään esimiesten vastuulle. Työyhteisöt, jotka eivät kykene toteuttamaan sovittuja kehittämistoimenpiteitä omatoimisesti, pitää tunnistaa ja heille kohdentaa kehittämisen tukipalveluja. Yleensä ne työyhteisöt, jotka eniten kaipaavat kehittämistä ovat kaikkein vähiten aktiivisia hakemaan itse kehittämiseensä tukea.

Kyvykkyyksillä vaikuttaa olevan selkeä vaikutus henkilöstötuottavuuteen ja kykyyn kasvaa kannattavasti. Olisi kiinnostavaa rakentaa matemaattinen yhteys kyvykkyyksien ja henkilöstötuottavuuden tuloskorttien välille, jolloin voisi laatia erilaisia skenaarioita organisaation kehittymisestä. Tämä laskentatyökalu toisi organisaatioiden kehittämiseen ja strategiseen suunnitteluun liiketoimintalähtöisen ja henkilöstölähtöisen näkökulman.

Tutkimus nosti esille sen, että kyvykkyyksien vaatimukset muuttuvat sisäisten ja ulkoisten muutostekijöiden vaikutuksesta. Näitä kyvykkyyksiin vaikuttavia sisäisiä ja ulkoisia tekijöitä voisi jatkossa tutkia tarkemmin. Kyvykkyydet vaikuttavat myös toisiinsa. Esimerkiksi heikko tai huonolaatuinen esimiestoiminta vaikuttaa varmasti negatiivisesti työyhteisön toimintakulttuuriin ja vastaavasti hyvä esimiestoiminta edistää hyvän toimintakulttuurin syntymistä. Kun kyvykkyyksiä voidaan kehittää hiljaiset signaalit HRIS menetelmällä, voidaan kenties paremmin oppia tuntemaan eri kyvykkyyksien välisiä vaikutussuhteita. Näin voidaan analysoida työyhteisöjä ja koko organisaatiota älykkäänä inhimillisenä systeeminä ja ainakin lähtökohtaisesti kasvattaa kyvykkyyksien kautta niitä edellytyksiä, joilla organisaatio voi edelleen oppia ja kehittyä.

Toimintatutkimuksen jälkeen on organisaatio jatkanut systemaattista kyvykkyyksien kehittämistä hiljaiset signaalit HRIS menetelmällä. Kolmen vuoden kuluessa liikevaihto on lisääntynyt noin 20 % ja yritys on kasvanut toimialallaan merkittävimmäksi yksittäiseksi toimijaksi Suomessa.

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Human tacit signals at organization performance development

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Abstract

Purpose – The purpose of this paper is to deal with tacit signals and organization performance development. Tacit signals are personal guiding beliefs that arise from tacit knowledge. The paper describes theoretical hypotheses how tacit signal method is utilized in competence measurement and organization performance improvement. Theories are evaluated by empirically grounded study.

Design/methodology/approach – The tacit signal approach is linked to human pressure-performance theory of inverted *U*-curve, known as Yerkes-Dodson law. Moreover, a new mental model of five interrelated competences is used in order to understand the pluralistic nature of organization development. These five competences are management, leadership, culture, skills, and processes. The paper describes how competences can be studied by tacit signals, offering positive elements for both management and performance. The case study is done in Finnish commercial business enterprise of approximately 1,000 employees.

Findings – Empirically grounded case study supports the theoretical approach, showing that tacit signals are in correlation to organization performance. Tacit signals help working groups identifying their collective dissonance in a way that will help them to increase emotional intelligence and performance. In the case, company significant improvement in profitability is found.

Originality/value – The paper connects researcher innovation of tacit signals to organization competence measurement. This paper supports hypotheses that persons have tacit knowledge of personal situation at pressure-performance curve. This situation can be measured for each competence by tacit signal inquiry which guides to optimal improvement which strengthens the group emotional intelligence and increases performance. The described tacit signal method and system intelligence model gives additional value to further scientific studies.

Keywords Competences, Human capital, Organizational performance, Profit, Tacit knowledge

Paper type Research paper

Introduction

The internal and external environment of organizations is changing continuously, which causes challenges for human competence development and management. Most of the quality costs form from poor work practices causing lost labor (Andersson *et al.*, 2004). Hence, continuous development is important for maintaining competitive advantages. However, many managers do not understand the nature and potential of work organization development (Alasoini *et al.*, 1997). Improving organization operations is complicated because development should be based on knowledge of employees in working societies (Pfeffer and Sutton, 2000). Organizations need

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conceptual understanding and practical tools to analyze, plan, and implement the change process (Alasoini *et al.*, 1997). Hence, an obvious need for developing the organizational information systems (Beynon-Davies, 2002) exists especially in the area of human resources.

In case of humans and competitive advantages, the organizations want to improve their human competence recognition and management. Usually, the human competences are found so difficult and complex that recognition or development cannot be done easily. In addition, the traditional methods are repeatedly too expensive, slow, or otherwise complicated for achieving continuous performance improvement.

This paper will demonstrate tacit signal method as an effective electronic human resource management (e-HRM) system for utilizing tacit knowledge in organizations. The tacit signals refer to personal guiding opinions that can be used at improving the human competences (Stone, 2002; Kesti, 2005, 2007). In working units, these guiding opinions help solving problems which is also fundamental element of effective leadership. "The leader who wants to create an emotionally intelligent team can start by helping the team raise its collective selfawareness" (Goleman *et al.*, 2008). Collective emotional intelligence seems to be characteristic for top performing teams (Wheelan, 2005).

New tacit signal based e-HRM system is introduced as a human resource information system (HRIS) (Kesti *et al.*, 2008). An information system itself can be seen as a physical process that supports organization by providing critical information to achieve goals (Syväjärvi and Stenvall, 2006). The current HRIS is seen as a support for effective leadership and performance management. This helps leaders to identify and accomplish improvement actions across the working community based on the collective tacit knowledge. By tacit signal method, it is possible to relate the human competence success factors with positive spiral and thus minimize the risk of low-human competence utilization. Our research study indicates that measured tacit signal competences correlate with working society performance and therefore support organization performance management and productivity improvement.

Employees can be divided, for example, to three categories in terms of performance: top 20 percent, middle 70 percent and bottom 10 percent (Welch and Welch, 2005). Our observation is that there seem to be same phenomenon at working teams which prevent organization performance improvement. Our empirically grounded research reveals that normally only 20 percent of organization groups seems to succeed in developing their work practices and 80 percent are not able to solve their disagreements and problems by themselves. Furthermore, our observation is that in many organizations the limited development time is misused so that 80 percent of that time is used at not constructive defensive mechanisms and only 20 percent for doing improvement actions for solving problems. When both these rules apply, the organization cannot improve productivity without effective tools and methods.

These organization development obstacle Pareto-rules are extremely crucial for labor-intensive organizations in private and public sector. Effective development methods with proper tools should enable to convert these obstacles to great possibilities to improve organization performance and productivity.

Research aim is to find the tacit signal method link to other organization development studies and create theoretical contribution for further research. Furthermore, the paper will study three practical research hypotheses, which are:

H1. By tacit signals, the group collective competence can be measured in a way that foresees the group's performance.

H2. Tacit signal competence development process improves competences.

H3. Using tacit signal-based organization development systematically at each working team, it is possible to increase whole organization performance.

These hypotheses are the basis for overcoming the challenges in organizations performance improvement by utilizing human assets.

1. Background

In modern society, the economical meaning of knowledge base and intangible assets have exceeded material capital, natural resources, and work force (Drucker, 1993). To succeed, the organization should have process where each person and group can reflect knowledge and experiences and so improve the contribution to the organization objectives (Argyris and Schon, 1978). Several research studies show that organizations which are committed to the employees and let the tacit knowledge base increase are the most successful in longer term (Collins and Porras, 1994; de Geus, 1997; Ylöstalo, 2005; Jeffrey, 2004). In some business areas, the intangible assets managing is the most important issue in creating competitive advantage (Porter, 1985). Therefore, human intangible assets should be one of the most important development items in the organization. These human success factors or competences are intangible drivers of performance which are normally difficult to develop.

Management has important role in identifying performance drivers and investing in the development. Top management should build visionary and inspiring mission for the organization, so that everyone is struggling along to the same direction (Collins and Porras, 1994). Top management, leaders, and workforce all have essential elements for the organization performance and success. As in a car you cannot say which part is the most important thing the steering wheel, tires, or the motor.

Human being is naturally social and in interdependency the learning is the most effective and natural phenomenon (Vygotsky, 1978). Organization knowledge forms from collective learning and sharing of information (Prahalad and Hamel, 1990). Knowledge can be divided to explicit and tacit knowledge. Explicit knowledge is rational and can be described and visualized by documents and pictures (Nonaka and Takeuchi, 1995). Tacit knowledge is experience-based knowledge that is difficult or impossible to document or describe by words (Nonaka and Takeuchi, 1995). Tacit knowledge is highly personal emotion and feeling based. Nonaka and Takeuchi (1995) describe the new knowledge creation with interactive social process between explicit and tacit knowledge. Tacit knowledge has to be formulated to words or documents, so that it can be further converted to explicit knowledge which creates again new tacit knowledge. Social intercommunication like dialogue, discussion, and observation speeds up knowledge creation process and activates organization learning.

One of the most extensively studied theories in social psychology is cognitive dissonance. It is an uncomfortable feeling when two contradictory ideas affect simultaneously. Festinger (1957) proposes that people are motivated to reduce dissonance by changing or modifying their attitudes and behaviors. For example, if a person encounters a problem at work, which should be told to the leader or colleagues but the person have negative experience when presenting some problem earlier.

Therefore, he feels dissonance – the problem ought to be told, but it causes resentment. Dissonance may be resolved in such a way that he creates defensive reasoning for not to do anything about it (Argyris, 2004). Senge (2006) describes the same phenomenon so that organization learns harmful defensive routines which prevent problem solving and organization learning. "Defensive routines are so diverse and so commonplace, they usually go unnoticed," says Senge (2006). Team's success depends on its ability to face the problems and to overcome defense mechanisms that surrounds the problems (Argyris, 2004; Senge, 2006).

It has been shown that the best performance or optimal cognitive efficiency is achieved at optimum stress level (Goleman, 2006). Certain creative stress or tension is needed to get things done. When optimal stress level is exceeded the performance will drop down as harmful stress level increases (Abercrombie *et al.*, 2003). This tension-performance phenomenon is called inverted *U*-curve and was introduced by Yerkes and Dodson (1908) and is known by Yerkes-Dodson law. Goleman (2006) points out that stressed people become defensive and too high-stress hormone levels causes mistakes and disables learning new things. A sense of safety creates good base for learning and some tension is needed to keep on the motivation (Goleman *et al.*, 2008).

It seems that there are certain performance drivers which can be recognized as organization competences. As employees are the best experts of their own work, they have tacit knowledge-based feelings about the development needs. If these personal feelings could be measured for each vital competence using inverted *U*-curve principle, it could be possible to do right corrective actions to improve the competence. As inverted, *U*-curve correlates with performance the measurement should have the same feature. The tacit signal method appears to have these qualities.

If organization can keep competences in good condition when facing new challenges, it can also maintain good business performance. This balance between creative tension and competence development is important for organization continuous improvement. Senge (2006) points out that goal setting and balancing feedback must go together in balance to perform goal-oriented operation. If balancing feedback is blocked, it will complicate strategy implementation. By measuring tacit signals, the managers and leaders can make right decisions to improve the performance drivers to optimal balance. Measurement-driven culture in intangible assets and business performance helps management to understand how to achieve greater return from intangible assets investment (Chareonsuk and Chansa-ngavej, 2009).

2. The tacit signal method

The tacit signals are personal feelings and ideas relating to improvement needs arising from emotional and tacit knowledge. They can be related to needs to unlearn harmful defensive mechanisms or needs to reinforce good practices. When the organization is recognizing those beliefs, it can improve competences more consistent with the goals of the organization.

Nonaka and Takeuchi (1995) point out that each employee is a knowledge worker who has important tacit knowledge about the organization operations and own work. Human drivers of performance are the known competence factors contributing organization to improve productivity and achieving the targets. Competence potential has a direction which shows how much of the potential is utilized. Senge (2006) says that persons have different degrees of personal power (ability to accomplish

intended results) and this power should be aligned with the team targets. In this specification, the potential can be shown as a vector where the part leading towards the target is the competence (Figure 1).

Measuring and analyzing tacit signals in real time, the optimal improvement actions can be started effectively. Goleman *et al.* (2008) point out that these improvement ideas attuning to the reality help moving away from dissonance towards an emotionally intelligent and effective group. For increasing organization performance, it is essential to overcome knowing doing gap that usually prevent learning (Pfeffer and Sutton, 2000). Performance improving and clarity of work come from doing the right actions based on the existing knowledge or information of the organization (Pfeffer and Sutton, 2000; Syväjärvi *et al.*, 2005).

The principle of interrelated and opposing factors affecting at organization is raised in the Nonaka and Takeuchi book *The Knowledge Creating Company*. They have observed that there are multitude dichotomies – such as tacit vs explicit, mind vs body (or matter), and self vs others – are affecting on organization knowledge creation. These dichotomies are not different coins but rather the opposite sides of the coin being mutually complementary (Nonaka and Takeuchi, 1995).

In our research from several organizations, we have noticed that optimal condition for organization development exists when two affecting complementary sides are in harmony. Furthermore, the development need is determined based on the side of possible unbalance. This approach of two interrelated forces guiding to correct the organism back to harmony is also visible at oriental philosophy of yin and yang (Xinnong, 1999). The same phenomenon is included in Yerkes and Dodson (1908) law of tension-performance relation (inverted *U*-curve), which is important basis of human performance and emotional intelligence development.

In tacit signal inquiry, there can be used several different dichotomy scales (Kesti *et al.*, 2008). In this research, the chosen dichotomy scale is increase quantity – develop quality, which seems to fit well to the phenomenon of inverted *U*-curve. Figure 2 shows how tacit signal shows if there is balance or unbalance in the chosen competence. In the tacit signal e-HRM inquiry, each employee gives guiding opinion about the development need for each competence attribute.

Measuring competences by the tacit signals has the following instructions:

(1) choose competence attributes that are important for the organization;

(2) choose guiding dualistic scale for tacit signal measurement (need to increase quantity – need to develop quality);

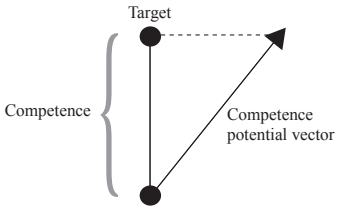


Figure 1.
The competence vector principle

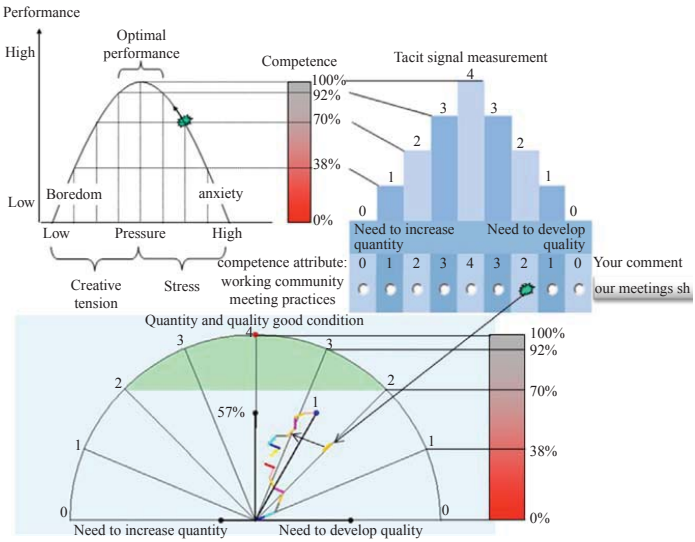


Figure 2.
Tacit signal principle in performance stress curve

Note: Inverted *U*-curve

(3) classify each working group in the organization hierarchy, preferably minimum size five persons for securing privacy in anonymous answering;

(4) tell all employees about the tacit signal inquiry and point out the value of employees' experiences; and

(5) measure tacit signals from each working unit so that every person has possibility to answer to e-HRM inquiry in own peace.

Dichotomy improvement semicircle (Figure 2) adapts to the size of the group, so that every individual tacit signal vector can be summed, showing the collective development need and competence (Kesti *et al.*, 2008). The main idea in measuring the tacit signals is to increase the innovativeness and profitability through better management and development of the whole organization. It improves organization's ability to prioritize development actions effectively.

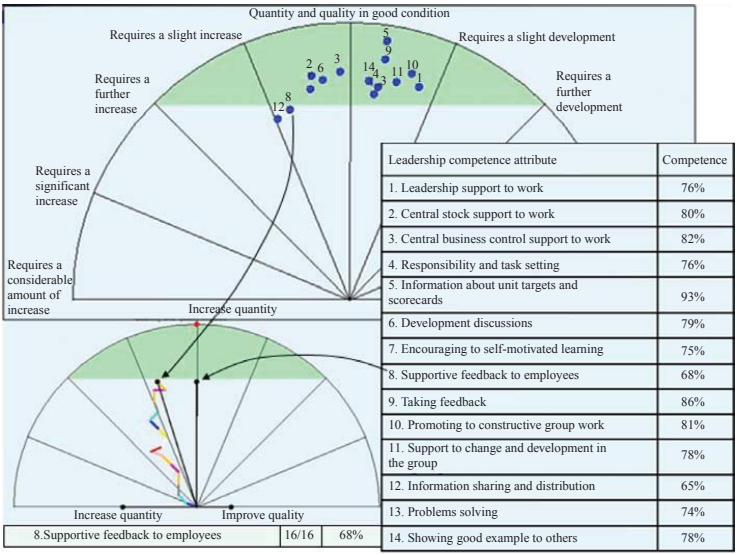
3. The tacit signal measurement in practice

Measured competence can be linked to scorecards like quality costs, work absence, disembarkation rate, and productivity. Knowledge, know-how, and employee competences and engagement have great affect on internal process and business performance and therefore these intangible assets can be seen as scorecards for learning and growth (Chareonsuk and Chansa-ngavej, 2009). Therefore, measuring tacit signals fits well for the balanced scorecard (Kaplan and Norton, 1996) measures for the learning and growth perspective.

Kaplan and Norton (1996) point out that the balanced scorecard has been lacking good company specific measures for the learning and growth perspective. They note that absence of specific measures indicates that the company is not linking its strategic objectives to activities for re-skilling employees, supplying information, and aligning individuals, teams and organizational units to the company's strategy and objectives (Kaplan and Norton, 1996).

The tacit signals competence measurement with improvement actions follow-up makes possible to measure balanced scorecard learning and growth perspective. The tacit signal measurement is leading to optimal improvement actions because it utilizes guiding dichotomy scale for improving organization competences. In current approach, the measurement is supported by the well-known idea of human capital. This means that results are socially and qualitatively processed by people. Hence, after measurements such collective practices (i.e. meetings, discussions, and group forums) are performed that truly value human experiences and the importance of human communication and interaction.

Tacit signal measures the development need with the direction to improve the competence. The development is needed if competence is low level. The measured improvement focus is on the side where the unbalance is. In Figure 3, the case organization group of 16 persons (answers) collective competence is 68 percent against the measured competence attribute: supportive feedback to employees. The semicircle radius is divided to 16 line segments so that every answer has the same weight. Competence attribute is slightly under 70 percent alarm zone and the development



Leadership competence attribute	Competence
1. Leadership support to work	76%
2. Central stock support to work	80%
3. Central business control support to work	82%
4. Responsibility and task setting	76%
5. Information about unit targets and scorecards	93%
6. Development discussions	79%
7. Encouraging to self-motivated learning	75%
8. Supportive feedback to employees	68%
9. Taking feedback	86%
10. Promoting to constructive group work	81%
11. Support to change and development in the group	78%
12. Information sharing and distribution	65%
13. Problems solving	74%
14. Showing good example to others	78%

Figure 3.
Example of the tacit signal group measurement

need is on quality side. The tacit signal inquiry also collect written comments for each competence attribute. The group comments on the supportive feedback as follows:

> Support I have had enough
>
> It is easily forgotten in a hurry
>
> Encouraging selling more [. . .] sell [. . .] sell.
>
> We have enjoyed cakes and looked figures and yes thanks are also given
>
> This totally lacks from us

In Figure 3, the collective development needs varies (line segments are in different orientation) which obviously means that leader should pay more attention to supportive discussions in group and notice individual characteristics in personal support. This assumption may be supported by comments and should be verified in group development meeting.

4. The tacit signal connection so organization competences

Human tacit signals are able to guide an organization to desired improvements. In case of improvements and performance, the understanding of both people and management has a vital role (Losada and Heaphy, 2004). One general management classification is given that specifies five management areas which are planning, organizing, directing, coordinating, and controlling (Fayol, 1949). In addition, Drucker (1977) points out successful management areas so that among target setting management requires organizing, motivating, communication, measuring, and employee development (Drucker, 1977).

Schein (1985) says that one of the most important management tasks is to strengthen the organization culture. Manager must ensure that working community can develop and positively adapt to continuous change of business. A good manager and a leader observe weak signals and when needed starts collective discussion and co-operation to develop the organization knowledge base, products, processes, and tools. The strategically relevant competence is never certain, but rather exists in the form of beliefs which are inconsistent or even contradictory (Sanches and Heene, 1997).

Competences are situation sensitive and therefore constantly changing as organization internal and outside environment changes. Our study has shown that, for example, high-staff turnover rate decrease the collective competences (leadership and group culture). This is logical as the competences need to be updated to meet the new challenges. Therefore, competence development is needed to stabilize organization performance to a new level. This is referring to the balancing feedback (Senge, 2006) which is needed for organization development. However, the organization development is not so straight forward since competences seem to affect to each other. For instance, individual skills are important but do not guarantee organizational learning (Senge, 2006). Group culture affects to the motivation in sharing and adapting information. To make organization learning possible, the competences relation to each other should be recognized.

Organization might be a complex human intelligence system where different competences are interrelated to each other (Prahalad and Hamel, 1990; Syväjärvi *et al.*, 2005) (Figure 4). We have described organization system intelligence model by using an ancient mental model of interrelated five elements. In system intelligence model, the five elements are main competences which seem to be the most important intangible

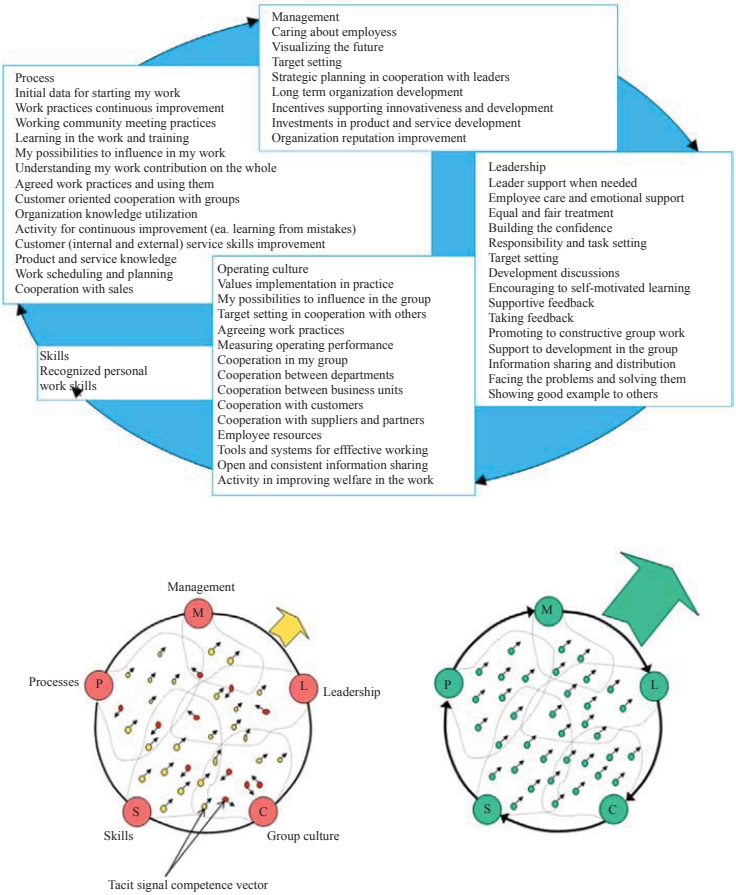


Figure 4.
Organization system intelligence consisting five competence areas affecting to each other

drivers of performance. These five competences are management, leadership, culture, skills, and processes. Each competence has several attributes that describes the human success factors which should be in a good condition for optimal organization development and positive organization learning spiral. Leadership and culture are collective competences that consists similar competence attributes for each working society. It seems possible to measure these attributes by tacit signal method.

The tacit signal balance shows if the competence needs reinforcement or development. Unbalance in reinforcement side means that the competence is not strong enough to form a positive spiral and therefore needs more activating. Unbalance at

quality development side means that the competence affects negatively to the system. This needs changing the harmful habits and therefore quality side development is more difficult and critical for the organization future. For the organization development as a system, it is important to solve the problems but also to strengthen the competence attributes that has positive influence contributing positive spiral. Seeing and analyzing organization as a system with interrelated competences the organization can be developed optimally and with increased profit earning capacity.

5. Tacit signal development process

The tacit signal measurement is connected to competence development process for effective organization performance improvement. Managers' and leaders' participation to the development process planning is essential prior to tacit signal method implementation. Knowledge creation process includes always that the results are gone through in each working group after the management review. In the management review, the whole organization is analyzed at strategic point of view by using the system intelligence model. After that, each working community goes through their own results with discussions and prioritizing the corrective actions. Chosen improvement actions realization is activated by practical support services.

Our research indicates that effective competence development process using tacit signal method should have following five phases:

(1) Management and planning:
   - Competences recognition and connection to strategy and scorecards.

(2) The tacit signals collection:
   - Tacit-signals are collected from the organization classified to working teams.

(3) Planning the strategy focus at management level:
   - According organization tacit signals the development focus is chosen.

(4) Improvement action planning at working community level:
   - According the group tacit signals each organization group agrees the improving actions with follow-up responsibility and time-schedule.

(5) Leading and support:
   - The actions implementation is followed up and supported by managers and leaders.
   - Group follow-up meeting and forums for sharing experiences and good practices.

Our empirically grounded research has shown effectiveness of tacit signal method in organization knowledge creation process. The group is able to share knowledge and agree optimal improvement actions within couple of weeks. In this development process, each employee spends about half-an-hour answering to tacit signal query and two-and-a-half hours in the group development meeting. It seems that the tacit signal method speeds up the knowledge creation process significantly. Each group can agree the corrective optimal actions in constructive way by consuming only approximately three hours. Leaders are participating in these meetings and their role as a leader is strengthened.

Our empirically grounded research shows that group is committed to the actions when they are participating to action idea generation. Group development meeting is effective because measurement results leads to constructive discussion and concrete development. This beneficial brainstorming increases group collaboration and self-esteem. Group innovate corrective actions and prioritize the most important. Agreed actions are followed by electronic group diary and supported by group meetings later on.

6. Results in organization performance improvement

Case results are based on empirically grounded research at large company (about 1,000 employees) for three years period. The case organization is Finnish national wide trade company in high-competed business branch. The research was performed in 19 business units which all have the same centrally guided business processes in similar markets (Finland). Besides, the market structure also the population basic education is identical in all business locations. These units which participated to the research were size of 13-108 employees. Generally, in this high-competed business area the biggest enterprises have difficulties to maintain profitability and market share.

This empirically grounded study was part of normal business-to-business project between consulting company and client. It started as development project planned for one year, but encouraged by good results, it was repeated twice until the depression. Development project targets were employee welfare and company productivity improvement. There were sales targets which needed staff commitment and motivation. Also, leader's participative management needed strengthening. Management and sales support were motivated to find strategically important development ideas.

The tacit signal competence development process was implemented systematic in periods of one year. The tacit signal e-HRM inquiries were carried out via internet using application software provision. Leadership and group culture competences were measured once a year at each 19 business units. Employee participation to the inquiry was 50 percent in each development cycle. Those who answered to tacit signals inquiry gave plenty of written comments. In three years, there were given 2,671 comments so on average there came around two comments per person answered. Competence development process was done systematically at every unit.

In each unit, the results were analyzed and development ideas were agreed collectively. These group development meetings were held in both working shifts in each unit so that every employee could participate. In the group development meeting, the improvement ideas was generated and four practical development actions were chosen with the leader. After couple months of these development meetings, there was one follow-up meeting per business unit. This follow-up meeting was only for leaders and some personnel representatives. Thus, there were 38 group development meetings per year added with 19 development implementation follow-up meetings.

Further, the systematic tacit signal development process took around three hours time per employee. At this time, there were four optimal improvement actions agreed per working unit. For doing agreed improvements, there were allocated additional 15 hours per year for doing the improvements. This means that approximately 1 percent of total working time was used per year for doing collectively agreed four improvements. As a result of this development, the work practices were improved by practical innovations based on group's tacit knowledge (e.g. meeting practices).

The result of this systematic organization development was encouraging. After three years development period, the company announced press release that they had achieved the market leader position in Finland. The company sales margin was 12 percent and human capital return on investment (HCROI) 9 percent better than average business branch. At the same time, the company was investing to growth so that their staff increase was 6 percent higher than average business branch.

In Table I, there is summing-up data of case organization in three years time. They are in order of magnitude of first measurement average competences (Figure 5). The units are divided in two groups; lower- and higher half according competences (1. measurement). Company's performance business scorecards are revenue, staff increase, gross profit and HCROI. The higher-half improved these scorecards most. It was also visible that staff turnover affects negatively to performance. The turnover rate was higher at lower half. Competences affect positively to performance which is visible in higher half. The tacit signal competence improvement process shows that lower competences are increased more than competences already at higher level.

Following results where indicated:

- high competences (leadership and culture) seems to correlate with improving performance scorecards (revenue, gross profit, and HCROI);
- lower competences where improved more than high competences;
- high competences seem to improve new workers orientation as HCROI was improved, however, staff increase was greater; and
- staff increase and transfer seems to decrease competences.

Our studies in this large company indicate that in three years period the tacit signal development process has improved company productivity significantly. Measured leadership and culture competences seem to correlate with employee productivity; however, the variety in scorecards were considerable. This is understandable since there are also plenty of other important factors like market situation, local competition and unit age which are affecting to organization performance. HCROI is an index that comes from sales margin divided by staff costs (Fitz-enz, 2000). Employing new staff is investment that at least in short-term reduces profitability.

It seems that average competence improvement is not the only aim, but also increasing the weakest performing group's competences and performance. The competence variation gives essential information about improving organization business performance. At first, measurement before development process there were three units below 70 percent in average competences. After development process all units raised over 70 percent in competences (leadership and culture). In this study, the units are arranged in order of competences magnitude (Figure 6).

Observing the best five units and the worse five units in competences, there is seen that high competences correlate with performance scorecards. It seems that when there is business possibilities to grow the units with high competences can utilize the possibility. Better revenue is achieved with improved gross profit. These best units increase staff and gross margin simultaneously (Figure 7).

In this proper case, the competences were developed systematically. We noticed that when staff remained the same the competence improvement was more than in case where growth, transfer or reorganization changed the group arrangement.

	Competences 1 (%)	Competences 2 (%)	Competences 3 (%)	Revenue increase (%)	Staff increase (%)	Gross profit increase (%)	HCROI increase (%)	Staff transfer (%)	Competence increase (%)
Unit 1	67	76	75	3	22	16	2	21	13
Unit 2	67	71	74	9	19	15	−1	38	11
Unit 3	69	75	71	10	15	7	−6	20	2
Unit 4	72	87	85	10	16	10	−9	5	19
Unit 5	72	81	78	36	13	26	4	16	8
Unit 6	73	85	87	56	14	45	32	5	19
Unit 7	76	86	82	21	24	23	4	10	8
Unit 8	77	71	72	19	40	22	−1	38	−7
Unit 9	81	80	83	28	20	16	−3	14	3
Lower-half average	*72*	*79*	*78*	*21*	*20*	*20*	*2*	*19*	*8*
Unit 10	81	81	79	30	16	26	4	17	−2
Unit 11	81	78	74	16	10	17	2	38	−9
Unit 12	82	82	77	12	21	23	−1	11	−6
Unit 13	83	87	89	80	43	39	3	3	8
Unit 14	84	82	79	16	17	15	−3	7	−6
Unit 15	86	82	84	32	21	21	−1	12	−2
Unit 16	87	85	89	80	37	51	23	13	2
Unit 17	89	80	75	8	27	28	10	17	−16
Unit 18	89	79	82	17	24	20	7	7	−8
Unit 19	90	88	90	15	27	9	−6	6	0
Higher half average	*85*	*82*	*82*	*31*	*24*	*25*	*4*	*13*	*−4*

Table I.
Summing-up structural data of the case organization

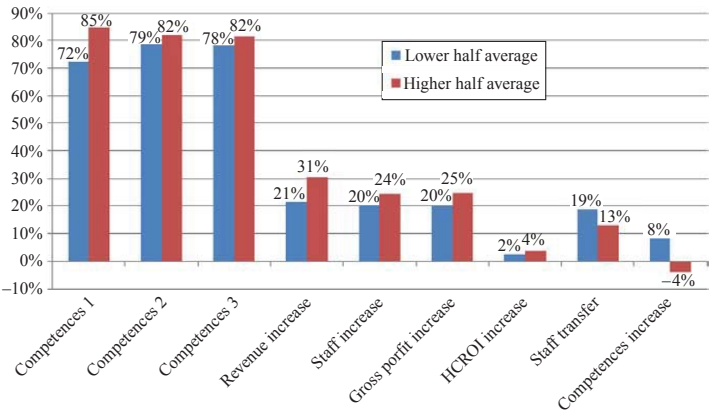


Figure 5.
Bar graph showing lower- and higher-half competences average data

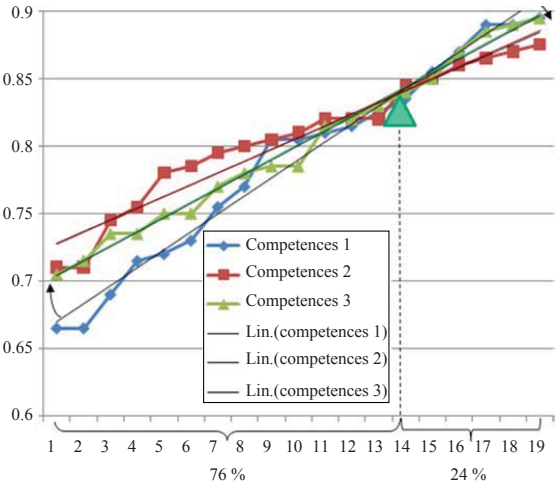


Figure 6.
In this figure, the units are in order of average competence magnitude

7. Future trends

Our review from several business and municipal organizations in Finland indicates the main intangible drivers of performance are close to the same for all organization types.

Empirically grounded approach to the organization development can be crystallized to the general system-theoretical approach to organization development. We have noticed that competence levels are not stable but constantly changing. Organization structural changes, laying-offs and substantial staff growth decrease measured

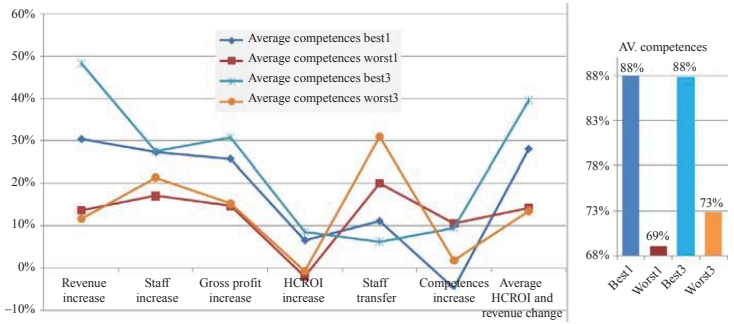


Figure 7.
Business unit's competence development related to employee performance

competences. Obviously, there are several other reasons which cause decline in the competences. In constantly changing environments, it is the competitive advantage if organization can improve low-performing group's competences and also maintain the level in groups having high competences. Thus, information and evidence is needed in HRM (Hamlin, 2007) in order to develop competence recognition and use. We believe that high-competence levels indicate also high innovativeness which helps organization to benefit either business or public sector possibilities.

The future e-HRM systems include intelligence that assists in directing the organization to operate proactive and effectively in utilizing human drivers of performance. It is also important to understand the drivers and key elements that help people in leading and coping with organizational needs and changes (Woodward and Hendry, 2004). Organizations are typically so complex that managers and leaders are not able to do optimal decisions. The current study will connect the tacit signal e-HRM measurement approach to latest research of organizations performance as a system so that managers can use the e-HRM tool in fast decision making in everyday managing and as a consequence optimize organization long-term performance.

Welch and Welch (2005) has pointed out that human capital metrics should be as important for management decision making as financial data. This research paper indicates that investments in human capital are extremely profitable. Organization continuous development speeds up organization learning contributing better business performance. Our research has raised need and possibility to estimate human capital risks and business possibilities in advance. In the future, we are trying to do human capital business scenario-calculation tool which includes human-related ratios like absence and transfer but also organization competences as intangible assets.

Finally, it will be challenging to find out mathematical links between HR-measures and business scorecards. However, we believe it is possible in adequate accuracy. This tool is needed to human capital planning for making development investments and avoiding human-related risks. This way management gets more strategic view to organization human capital development.

8. Conclusions

We need ways to translate human resource strategy to practice. The tacit signal approach seems to give reliable information for effective organization development,

helping management of human competences (Syväjärvi *et al.*, 2005). Research indicates that measured competences (leadership and culture) correlate with organization business performance. During three years of systematic development, the gross margin was improved each year much more than average business branch despite the staff size was growing faster than average. Furthermore, it seems that development process using tacit signal increase measured competences.

Improved competences seem to correlate with the organization business performance, measured by revenue, gross profit, and HCROI. The results support the research hypothesis, but also needs for additional research studies rose. For example, it was discovered that staff increase and transfer seem to decrease the competences. It is clear that staff increase reduces HCROI but it seems to reduce the competences and business efficiency as well. Also, staff transfer has negative affect to business scorecards. Therefore, organization changes are strategically important and those changes should always create better operating possibilities. These phenomenon should be studied more.

Competences and business performance improvement is possible with right improvement actions and without wasting effective working time. The research supports theoretical hypotheses that tacit signal measurement meets the idea of inverted *U*-curve (Yerkes and Dodson, 1908). Persons have tacit knowledge of their situation at pressure-performance *U*-curve and using tacit signal method the situation can be measured. This measurement gives guiding information for optimal improvement of performance. This finding is breakthrough in organization development and needs further studies and evidence.

The measured competences were leadership and culture. These competences attributes are important for both employee relationship and collective emotional intelligence (Guest, 2004; Goleman *et al.*, 2008). For example, these studies indicate that psychological contract between humans might have positive impacts, groups collective emotional intelligence foresee the group performance, high-emotional intelligence leads to better performance. Mental models describing human complexity can be useful when analyzing situation and possible defects, which might hinder competence development. The tacit signal competence measurement and mental model of five competences allow the organizational leaders to be more aware about human organizational behavior and both individual and organizational intelligence (Gibson *et al.*, 2003; Pentland, 2007). The tacit signals together with systematic development services enable the development of whole organization. This is important since the majority of the groups need tools and expertise to succeed in their work practices improvement (Welch and Welch, 2005; Pfeffer and Sutton, 2000). The weakest performing staff produces the majority, having most potential in profitability improvement (Welch and Welch, 2005).

The research evidence supports, that the tacit signal measured competences are suitable for balanced scorecard growth and learning perspective metrics (Kaplan and Norton, 1996). Agreed competence measurement and development are effective way to implement profitable growth strategy. By benefiting better the unidentified human assets, the public and private organizations can become aware of the positive impact of human factors. This is again an attempt to increase evidence-based information in management (Hamlin, 2007). As tacit signals are measured in real time and analyzing is guiding to the improvements, it is possible to start optimal development steps immediately. As contingency theory implies, these optimal improvement actions have

to come from the group needs and situations (Hunt, 1992; Greenberg and Baron, 1995). This has a motivation effect to all participants in organizations. It is shown that team performance correlates with group members positive feelings against negative (*P*/*N* ratio) and performance increase is more significant when *P*/*N* ratio exceeds 3 (Losada and Heaphy, 2004).

Knowledge creation process requires that measurement results are gone through with each working society. This group innovation forms effective foundation for knowledge creation and has a linkage to Nonaka and Konno (1998) theory of "Ba." Current findings are in accordance with Argyris and Schon (1978) research as in order to succeed the organization should have processes where each person and group can reflect knowledge and experience and thus to improve their actions. In this sense, the tacit signal e-HRM approach produces valid evidence for decision making, strategic planning and more flexible working practices. A proper HRIS is thus extra way to develop effective leadership (de Vries, 2006; Kesti *et al.*, 2008). Finally, these improvements can be linked to organization knowledge sharing, human wellbeing and productivity and thus supporting the organization performance management.

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Appendix. Key terms and definitions

Tacit signals.	Human opinions and feelings that are guiding to the improvement. Tacit signals are used at measuring competences.
Competence attribute.	A human property or characteristic in organizational environment that has value for organization performance.
HCROI.	HCROI calculated from revenue less operating expenses (excluding personal costs) divided by the personal costs.
Employee productivity.	HCROI increase along with staff and revenue growth.
Business performance.	Measured by revenue, gross profit, and HCROI.
Human competence.	A human property or characteristic according to which one has knowledge, capability, and skills in certain task to perform or behave. It is the organization's capability to benefit the known intangible drivers of performance for reaching its goals.
HRIS.	Use of information technology to systemically generate relevant and timely information for the making of HRM decisions.
Information system.	An information system is a system of communication between people and it involves the gathering, processing, and use of information.
Intangible assets.	Human capital, database or information system, responsive process, customer relationship, innovation capability, and culture of an organization that all are needed for distinctive and sustainable value.

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Human capital scenario analysis as an organizational intelligence tool for performance management

Abstract

This article describes a method for human capital scenario analysis, one that may be used as an organizational intelligence (OI) tool capable of supporting management decision-making. Here, scenario analysis supports a knowledge management based (KM-based) decisional method for integrating human resource (HR) and fiscal data in performance measurement. This OI scenario analysis tool may be used in strategic management, organizational development, performance measurement, and HR-related risk mitigation. The aim is to strengthen decisional capacity with regard to the management of human capital and in general with regard to the advancement of organizational performance and productivity goals.

The approach taken is that of human capital scenario analysis using system dynamics methods. Scenario analysis equations are developed on the basis of empirically-grounded research that has been conducted for several years at private companies and municipal organizations in Finland.

The scenario analysis (SA) tool successfully integrates organization-level human resource knowledge management with business scorecards, thereby assisting management decision-making. Through their use of the SA tool, managers can advance organizational learning and improve strategic decision-making. Human resource and organizational competencies are considered together, so that managers may consider key factors affecting future performance comprehensively, in their long-range decision-making.

The SA model was developed during a period of steady economic growth in Finland. While the model was created using the most germane literature and empirically grounded research, contextual factors such as relative economic prosperity may limit generalizability to other contexts.

The article describes how human resource metrics and competencies may inform performance measures, in particular business scorecards. The development of key competencies improves organizational performance and performance outcomes. As suggested by game theory, and by models of tacit communications, organizational competencies can be developed and performance outcomes enhanced by using "tacit signals" that are conducive to the realization of desired scenarios.

Keywords: KM, organizational intelligence, human capital, scenario analysis.
JEL Classification: M12.

Introduction

Human capital productivity has been calculated using metrics such as total revenue, sales margins, staff expenditures, staff absenteeism and turnover, and revenue/person (Kesti, 2007). One of the best human productivity indicators is acknowledged to be human capital return on investment (HCROI), which is sales margin divided by staff costs. Following these metrics is essential, but there should also be an understanding of the way such scorecards integrally affect and are affected by the given organization. Jack Welch (2005) argues out that human capital metrics should be as important for management decision-making as financial data. If these metrics were closely integrated with (or into) multi-criteria business scorecards, they could be given greater and more effective consideration in human resource decision-making. Investments in human capital have also been shown to be important in preventing or mitigating business risks, and they are, therefore, essential to risk management (Kesti et al., 2009; Kesti and Syväjärvi, 2010; TYKES, 2009).

Tacit signaling, long a mainstay of game theory and of organizational communications and motivation studies, is gaining recognition in strategic human resource management studies, in large part because of the work of one of the authors (Kesti et al., 2009). Kesti's research into tacit signaling has raised the possibility of estimation models that would allow for *a priori* calculation of human capital risks and business possibilities (Kesti et al., 2009).

Human resource management defines how organizational human capital may be aligned with strategy. Organization intelligence defines how organizational competencies and capabilities may be utilized systemically. Human resource management and organizational intelligence together produce the systemic capacity needed to achieve strategic goals (Ulrich and Brockbank, 2005).

This research study will present a human capital scenario analysis model cast as an OI tool, one whereby mathematically-defined linkages are created among the operational elements of human re-

This fully co-authored article was the product of an international collaboration.

sources, organization intelligence, and fiscally-oriented business scorecards. Scenario analysis (SA) here includes exact HR metrics such as staff absenteeism, labor mobility (such as transfers and resignations), and personnel turnover, but also intangible assets related to knowledge management and other organizational competencies. Such SA can inform the strategic planning of human capital development investments, as well as corresponding risk management. Crisis management often relies on a kind of scenario analysis, i.e., planning for worst-case scenarios as way to either prevent or recover from catastrophes (see Welsh, 2005). Whether in crisis or ordinary circumstances, it is essential to gain an appreciation of the complexity of the organization's overall work system (Kleiner, 2006). It is also necessary to engage in generative, creative ideation (Senge, 2006).

1. Human capital scenario analysis: theoretical background

Intelligence can be seen as the ability to learn, reason, and understand (Longman, 1987). Organizational intelligence (OI) refers to the management of both business and public policy intelligence. Nonaka and Takeuchi (1995) elucidate the mutually-reinforcing ways in which tacit and explicit knowledge interact to create the totality of organizational intelligence. Human capital can be tied to OI in connection to three defining elements: employee competencies, germane internal structures, and external domains such as customer relations and relationship management (Sveiby, 1997). HR-related business intelligence may be broadly applied in managerial decision systems (Hameed, 2004).

System dynamics − in one sense of the term − is a method for modeling complex systems by using computer-aided simulation. In the mid-1950s, Jay Forrester was able to show with his systems simulation that instability in general electric employment was principally due to the internal structure of the firm and not to external forces such as the business cycle (Forrester, 1961). Personnel performance has since been modeled using system dynamics considering factors such as staff workload stressors and employee fatigue (Rodrigues et al., 2006; Lyneis et al., 2001; Sterman, 2000).

The human capital scenario analysis (HCSA) approach taken here uses systems dynamics methodology describe the interplay of complex organization factors − performance drivers − that contribute to performance outcomes. Our approach links organization human resource (HR) metrics, HR competencies, and organization development to given organizational performance measurement systems or business scorecards. These competencies consist of management capabilities, leadership qualities, organizational culture, organizational processes, and individual and group skill sets (Kesti and Syväjärvi, 2010). HCSA is an essential, competency-based organizational development and assessment tool, which we build around the concept of tacit signaling, a form of implicit communication of productivity norms in organizations (see Kesti at al., 2008, 2009; Kesti and Syväjärvi, 2010). Our SA tool was applied, tested, and developed at a large Finnish company with nineteen business units, during a period of steady economic growth in Finland (years 2005-2008). This tool or method and its defining equations were tested and further refined during our current global recession, when downsizing and cutback management have become commonplace. We subjected this method to several forms of structural and behavioral validation (Barlas et al., 2000), empirically-grounded field tests, and boundary tests, sensitivity tests, and other control measures (Sterman, 2000).

Our study of Finnish public sector organizations revealed a lack of coherence between management and strategy (Oiva-Kess and Kess, 2010). Human resource practices were certainly in compliance with the requirements of law, but the agencies involved failed to fit human resource investments to organizational strategy. Across the board, moreover, these agencies lacked adequate performance-assessment practices suited to the evaluation of strategic performance and productivity (Oiva-Kess and Kess, 2010; see also Wilenius, 2008).

The development and measurement of essential competencies is essential to strategic knowledge management in organizations, since such competencies include organizational learning attributes that are critical for sustained productivity and growth (Kesti and Syväjärvi, 2010; Kesti, 2005, 2007; Bakker and Demerouti, 2007; Hackman and Oldham, 1980). Competencies can be measured for each distinct group in the organization with use of the aforementioned tacit-signal method (Kesti et al., 2008). Competency measures are in turn linked to scorecards like quality costs, absenteeism and turnover, and net profits.

Tacit signal measures fit well with Balanced Scorecard methods, in particular with regard to the dimensions of organizational learning and growth (Kaplan and Norton, 1996).

Defining elements of organizational learning and development include employee participation in managerial decision-making, planning, implementation, and the engagement of self-directed groups and teams. It is by virtue of such employee investment in management processes that the quality of work

life is improved, and with it staff and organizational performance (Ramstad, 2009; Kesti and Syväjärvi, 2010; Welch and Welch, 2005).

The Finnish Ministry of Trade and Industry has sponsored research indicting that quality-related cost drivers associated with human resource management (HRM) account for approximately six percent of lost revenue, and that the main cause for these quality costs are human error and wasted labor (Andersson et al., 2004). These findings suggest directions for human resource competency development for the sake of improved quality control, higher productivity, and greater profitability (Kesti et al., 2009).

2. Human capital scenario analysis principles

The basis of the human capital scenario analysis approach, here presented, is that there has to be a causal relationship between human resources and business or organizational results. Organizational process and applied analytics should conform to certain cause-effect rules, which are (Cascio and Boudreau, 2008):

- an effect does not happen until after the cause;
- cause and effect are actually shown to be related;
- the posited cause-effect linkage has no plausible rival hypothesis.

Our HCSA approach follows three meta-principles that conform to these requirements in most organizational contexts:

- revenue comes from staff activities (effective working time and productivity);
- staff direct costs (pay and benefits) bear directly on productivity outcomes;
- staff activities are also accountable as indirect costs (in particular, quality costs).

In addition to these meta-principles, our analysis utilizes a number of simultaneously active sub-hypotheses, as follows:

- turnover increases demand for resources and time devoted to the orientation of new (replacement) employees;
- absenteeism directly diminishes effective working time;
- competence development will improve work time effectiveness, or effective work time;
- competencies are improved by systematic internal training efforts;
- reducing the number of employees will increase employee capacity/competency development needs;
- increasing the number of employees will also increase capacity/competency development needs;
- increasing work time effectiveness − effective work time − will increase revenues and/or other indicators of organizational effectiveness;
- increased capacity along divisional or branch lines will improve capacity utilization.

Continuous improvement of organization performance will: (1) reduce employee absenteeism and turnover; (2) improve human resource capacity with respect to essential competencies; (3) bring quality cost savings to (reduce quality costs from) HRM.

As previously indicated, we define our OI model by way of five interrelated competencies: management capabilities, leadership qualities, organizational culture, organizational process; and individual and group skill sets (Kesti and Syväjärvi, 2010). These are key performance drivers in any organization, private or public.

The following graphic outlines the key factors or variables in the human capital OI system:

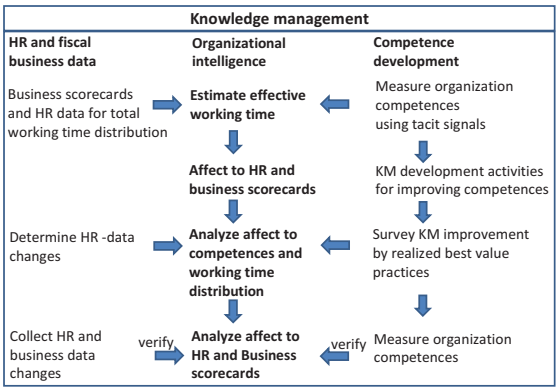

Fig. 1. Key factors of variables in the human capital OI system

2.1. Competencies and effective development. Competency development as indicated here is done systematically, at each working unit of the organization (division, department, etc.), aiming at process and outcomes improvements in each unit (Kesti and Syväjärvi, 2010). Empirically-grounded studies at several private and municipal organizations indicate that these improvements may be accomplished through a process of unit-level communications, whereby each work group comes to both explicit agreement and tacit consensus on a new results-based orientation. When bundle of four optimal workplace innovations are implemented using systematic Tacit Signal development process, just one fourth of one percent (0.25 percent) of each group member's work time is required to accomplish optimal improvement action (Kesti and Syväjärvi, 2010; Kesti, Syväjärvi and Stenvall, 2009). This means, for example, that for an eight-person team just one week's working hours − about 5 hours per person − are needed to determine, agree upon, and implement the chosen improvement initiative. In scenario analysis, effective developmental actions are projected as optima in the form of cumulative averages (Figure 2).

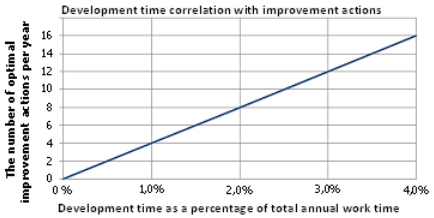

Fig. 2. Time requirements for developmental/improvement initiatives in work teams or units

This means that to implement four improvement actions throughout the organization would require approximately two and a half days, or eighteen to twenty hours of systematic time investment for each group or team and its members. It should be noted that reaching consensus on process and outcomes improvements appears, in and of itself, to improve group performance (Kesti and Syväjärvi, 2010), and there may in fact be other synergies attained across improvement initiatives.

In the previously noted empirical study in Finnish private and public sector organizations, four organization-wide initiatives based on the one percent time criterion appears to approach optimality. Contingency theory would indicate that there is no absolute best (optimal or maximal) solution or design, but rather myriad possibilities from which to select one well suited to (contingent upon) the situation being analyzed (Hunt, 1992) according to the efficacy criterion being used − following the propositions just reviewed, an efficacy or effectiveness criterion of one percent annual work time investment per individual or group per improvement initiative. These initiatives may address a wide variety of work practices, skill sets, tools, and dimensions of work such as cooperation and communication. Structural changes such as increases in the size of work groups may be expected to correspondingly increase the need for the development of human resource capacity in the form of group or team competencies (Kesti and Syväjärvi, 2010). Both structural and developmental changes require a revision or rearrangement of work practices, which modifications in turn will translate into developmental needs with regard to extant group competencies.

The next figure indicates the interplay of competency development and group size. As an example, a group downsized by seven percent can still realize seventy-eight percent improvements in levels of competency attained, according to simulations and observations on which we have relied.

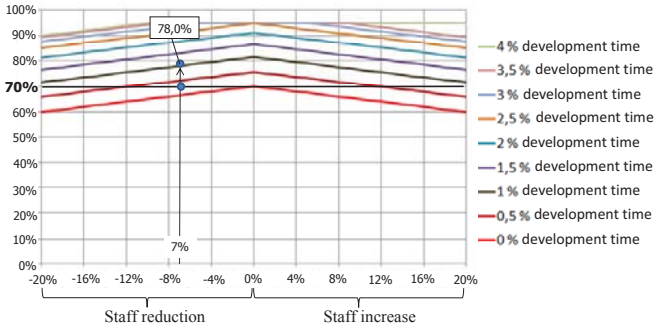

Fig. 3. Percantage improvement in key competencies when combining individual and group development changes

In HCSA, as presented here, performance increases or decreases can be analyzed proactively, so that causal connections to human capital development (defined in relation to increased competency or competencies) can be seen. Managerial competence is important for organization strategy and sustainable development. Leadership and culture competencies include attributes that are essential for group emotional intelligence, i.e., for the maturation of groups into self-directed groups (see Goleman, 2002). Process competence attributes correspond to group or collective task structures and procedures such as production or sales. Skill sets are personally-grounded and therefore related to factors such as training time and investment. In our approach to scenario analysis, each sort of competency assessment and corresponding cost measurement and investment estimation is conducted separately.

2.2. Introduction of performance indicators *HCROI*, *HCROI*(2) and *OSVA*. In our model, a human capital productivity ratio *HCROI* (human capital return on investment) indicates how human resource investment makes for increased sales and profit margins (Fitz-Enz, 2000). *HCROI* is calculated by dividing sales margin (€) by staff costs (pay and benefits, €).

$$HCROI = \frac{Revenue - (Materials\ and\ sup plies + Outsourcing\ costs)}{Staff\ costs}.$$

Sales margin is revenue minus by variable costs (materials, supplies, outsourcing costs, and the like). Therefore sales margins necessarily incorporate a part of the totality of quality costs (such as material waste and organizational slack). The *HCROI* ratio is good employee profitability index. The sales margin level is determined at the outset of data analysis, which analysis is then used as the baseline for calculating performance projections and for performance assessment upon rollout.

In the *HCROI* equation, staff costs are the denominator, so that staff increases will drop the ratio until the very investment in new staff begins to bring dividends to the organization, which should occur soon after new staff is fully trained and oriented. We have created an additional *HCROI* algorithm which incorporates the impact of investment in new staff, as follows:

$$HCROI(2) = \frac{Revenue - Variable\ costs}{Staff\ costs} \times (1 + Staff\ increase\%).$$

We have also created an algorithm to determine the value of outsourcing, for evaluating outsourcing return on investment. This particular ratio is called *OSVA* (outsourcing value added), and it is calculated with the following equation:

$$OSVA = \frac{Revenue - (Materials\ and\ sup plies + Staff\ costs)}{Outsourcing\ costs}.$$

In the logic of scenario analysis, all human capital, outsourcing return on investment, and other *HCROI* ratios should be considered together, in summative projections of benefits and costs.

2.3. Initial data for our human capital scenario analysis. Initial data for the scenario came from the most recently available annual fiscal accounting data, together with business prospect projections and certain human-resource-related estimations previously noted, such as training and orientation time for new staff. For example, if orientation time had been decreased from 12 months to 10 months that change should be justified on organizational performance grounds. Initial data specify the baseline for any prospects for improved performance and correlative cost reductions. For example, if baseline managerial competencies are low, it is obvious the possibilities for performance improvement are proportionately higher, as competencies are developed and organizational learning and productive capacity are thereby improved.

In populating the data sets required by the scenario analysis tool, both reported data and projected scenario values are input manually and then calculated automatically. Scenario values include the following data sets:

1. **Organization size** is gauged by the proxy value of average full-time equivalent (FTE) personnel per year. That includes all full-time wage personnel, while part-time staff is calculated by the individual's working time divided by a full-time employee's total yearly working hours (i.e., 1850 hours). For example if a part-time employee has contributed 140 hours of work time, her full-time equivalent or FTE is 140/1850 or .076 FTE.

2. **Revenue** is total revenue per reported fiscal year.

3. **Sales margin** is total annual earnings minus fixed and variable costs. As previously indicated, the latter include quality costs, encompassing material waste, slack time, and the like.

4. **Employee costs** include pay and benefits together with measures for additional labor costs relating to absenteeism, turnover, and the like, as previously indicated.

5. **Quality costs** are a means of showing the return on investments from quality improvement. Tracking and properly categorizing quality costs helps determine whether cost allocations are consistent with quality objectives as these relate to productivity and profitability. As suggested previously research

sponsored by the Finnish Ministry of Trade and Industry has indicated that demonstrable quality costs reduce revenues by an average of six percent on an annualized basis (Andersson et al., 2004). However, there are major differences and large variances in quality costs among business areas and companies studied, so that we use the six percent mean loss value as a default value in our model. Scenarios are precisely about choosing value projections for an organization, and thereby the organization's cost savings potential; consequently baseline and projected values for quality cost savings will vary widely across organizations.

In quality management, quality costs are typically divided into the following operational areas (BS 6143-2):

- prevention costs (the cost of preventive actions): training, orientation, guidance, instruction, quality controls, auditing, maintaining equipment in working order, cleaning and preventive maintenance protocols, alarm and security systems, and the like;
- appraisal costs: quality checks, testing, measuring, piloting, sample-taking, analysis, evaluation, and the like;
- internal failure costs: waste, scrap, redoing, fixing, rechecking, defect detection, correction, repairing, and the like;
- external failure costs: cost of responding to customer claims and complaints, cost of honoring warranties and guarantees, returned products, and the like.

6. **Orientation time** means the average time required for new employee orientation, in essence the time required for a new employee to become sufficiently knowledgeable and experienced to be effective in her job. This means that after orientation, the new employee should achieve the same workplace effectiveness as experienced staff. Orientation time requirements depend entirely on business area and corresponding competency requirements. In our scenario analysis, maximum orientation time is two years (twenty-four months).

7. **Marginal labor costs** normally vary in accordance with consumer price changes and with costs associated with customer relations (such as the external failure ones just noted). Either implicitly or explicitly, firms will generally set the marginal product of labor equal to the marginal cost(s) associated with labor. Marginal labor costs are a major type of *variable cost* across business firms and labor markets.

8. **A business area market change** − for instance, in a product or service mix or in the scaling of products and services − can be estimated with the use of industry statistics. When a business area market change is positive, the organization can fully benefit from effective working time and/or capacity enhancements. Conversely, when a business market is depressed, the organization's effective capacity to convert products or services to revenue is correspondingly reduced.

9. **Additional labor costs** are distinct from marginal labor costs, referring specifically to increased costs associated with new products or services, or changes in production. These costs are taken from human resource accounts. Additional labor cost values are needed for employee wage determinations. We take a default value 21.5 % from general industry statistics (StatFin, 2007). In planning, the benefits of a change in production process or service mix − or of a new public sector program initiative − must more than offset additional labor costs. This is another way in which detailed, quantified scenario projections are useful.

10. **Increased personnel size** has a great affect on business scorecards, since it obviously increases training requirements and orientation time, while decreasing the level of extant competencies in the organization. Increasing personnel size − equivalent to increasing the size of the organization, as already indicated, is a strategic value, and one which should be set in multi-year strategic planning. Increasing personnel is an investment for which payback time is usually several years away, and therefore one which needs to be carefully thought out.

11. **Average employee absenteeism** is calculated as a percentage of total annual staff work time. Both short and long absences are included in the calculation.

12. **Employee turnover** means that for every person leaving or transferring elsewhere, there a one new employee is brought in to replace her when circumstances warrant no change in FTE staffing.

13. **Continuous improvement and training** means that the organization has the capacity for human resource development in the areas of quality management and training. In scenario planning, this sort of human resource development must be done effectively, so that, for instance, a one percentage of work time devoted to development yields a four optimal improvements in quality and productivity at the level of the work unit or team.

14. The **development of competencies** (management, leadership, culture, skills and process) is a major, if relatively intangible, performance driver. For the purposes of accurate scenario-buildings, these skill and capacity competencies should be assessed once a year, which presupposes the establishment of competency definitions and measures.

15. **Outsourcing** costs need to be weighed against in-house production costs, internal capacities and resources, and the relative economies of contracted work. In other words, there needs to be a business case for outsourcing or (in the case of public-sector organizations) privatization or contracting out. Outsourcing costs are part of variable costs.

16. **Revenue change** per year is essential feedback data, calculated in our scenario tool as a correlative relationship between effective worktime capacity and revenue.

The following figures are, respectively, screen shots of our SA tool baseline data and of a matrix of cost savings achieved by the kind of continuous improvement initiatives just described.

Year	2005				
Organization size (FTE)	965	pcs			
Revenue	451 911 944	€			
Sales Margin	76 584 648	€			
Employee costs	28 006 197	€			
Estimated quality costs from revenue	4,0 %				
		2006	2007	2008	2009
New worker average work orientation time	10,0	10,0	10,0	10,0	10,0
Labour cost increase per year	0,0 %	0,0 %	0,0 %	0,0 %	0,0 %
Material and purchase costs rise per year	1,0 %	1,0 %	1,0 %	1,0 %	0,0 %
Business area market change per year	3,0 %	4,4 %	4,9 %	1,2 %	-7,8 %
Additional labour costs from total costs	21,5 %	21,5 %	21,5 %	21,5 %	21,5 %
Increase of personnel-%	5,0 %	10,4 %	9,6 %	5,0 %	2,0 %
Average personnel absence (%)	6,00 %	5,7 %	5,2 %	4,8 %	4,4 %
Personnel annual transfer (%)	16,00 %	15,2 %	13,9 %	12,8 %	11,7 %
Personnel training	0,5 %	0,8 %	1,0 %	1,0 %	1,0 %
Continuous performance development	0,5 %	0,8 %	1,0 %	1,0 %	1,0 %
Management competence	87,3 %	81,0 %	78,8 %	79,6 %	81,7 %
Leadership competence	77,6 %	74,2 %	74,6 %	77,0 %	80,1 %
Operating culture competence	80,4 %	76,2 %	75,8 %	77,8 %	80,6 %
Knowhow (skills)	87,9 %	81,4 %	79,0 %	79,8 %	81,8 %
Process competence	87,9 %	81,4 %	79,0 %	79,8 %	81,8 %
Outsourcing	37 011 588	38 972 286	44 381 193	49 547 322	49 571 627
Revenue change %		5,3 %	13,9 %	11,6 %	0,0 %
Summary of data	2 005	2 006	2 007	2 008	2 009
Personnel (FTE)	965	1065	1168	1226	1251
Personnel transfer (pcs)	48,3	100,4	102,3	58,4	24,5
Number of new employees (pcs)	202,7	262,3	265,0	215,0	171,0
Number of terminated employment (pcs)	154,4	161,9	162,7	156,6	146,4
Absence days per employee (days)	14,8	14,1	12,9	11,8	10,8
Training time per employee (days)	1,2	2,0	2,5	2,5	2,5
Performance improvement per employee (days)	1,2	2,0	2,5	2,5	2,5
Revenue	451 911 944	475 852 091	541 894 905	604 973 403	605 270 177
Staff costs	28 006 197	30 918 841	33 754 922	35 360 154	36 080 071
Sales Margin	76 584 648	78 896 801	87 967 022	95 569 481	97 770 252
HCROI	2,73	2,55	2,61	2,70	2,71

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Fig. 4. Scenario analysis baseline data

	2005	2006	2007	2008	2009
Organization size	965	1065	1168	1226	1251
Average absence	6,0 %	5,7 %	5,2 %	4,8 %	4,4 %
Employee transfer	16,0 %	15,2 %	13,9 %	12,8 %	11,7 %
Development affect in reducing quality costs	5,0 %	8,0 %	10,0 %	10,0 %	10,0 %
Revenue	451 911 944	4,76E+08	5,42E+08	6,05E+08	6,05E+08
Estimated cost saving from continuous performance development					
Competence development	**2005**	**2006**	**2007**	**2008**	**2009**
Management	180 765	373 276	525 736	532 337	484 038
Leadership	180 765	373 276	525 736	532 337	484 038
Operating culture	180 765	373 276	525 736	532 337	484 038
Knowhow (Skills)	180 765	290 084	386 431	398 251	358 663
Processes	180 765	290 084	386 431	398 251	358 663
Estimated total cost savings per year	903 824	1 699 996	2 350 070	2 393 511	2 169 440
Kumulative cost savings	903 824	2 603 820	4 953 890	7 347 401	9 516 841

Fig. 5. Cost saving scenario based on continuous improvement initiatives

2.4. Working time distribution. Our scenario-analysis approach lays stress on effective worktime distribution, defined as time efficaciously devoted to organizational goals, objectives, and projects that accord with organizational mission – the classic goal-alignment criterion for human resource effectiveness. The following screenshots display calculations of related values (BS 6143-2). Revenue-generation is a crucial determinant of worktime effectiveness. Revenue generation is influenced by all of the aforementioned human resource factors that impact efficacy (such as FTE, turnover, absenteeism, and individual and unit/organizational competencies).

	2005	2006	2007	2008	2009
Organization size (FTE)	965	1065	1168	1226	1251
Absence	6,0 %	5,7 %	5,2 %	4,8 %	4,4 %
Orientation	8,8 %	10,3 %	9,5 %	7,3 %	5,7 %
Training	0,5 %	0,8 %	1,0 %	1,0 %	1,0 %
Vacation	11,7 %	11,6 %	11,6 %	11,7 %	11,8 %
Own development time	0,5 %	0,8 %	1,0 %	1,0 %	1,0 %
Other working time (e.g. waste labour)	11,5 %	15,0 %	16,2 %	15,7 %	14,3 %
Effective working time	61,1 %	55,9 %	55,6 %	58,4 %	61,8 %
	100 %	100 %	100 %	100 %	100 %

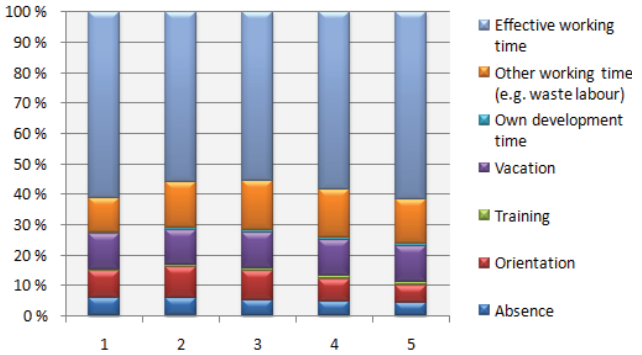

Fig. 6. Scenario analysis worktime distribution scenario

2.5. Business results. For business results, the necessary scorecards are collected for five year scenarios. The baseline data is for an organization that is in a steadily growing market and is improving performance through continuous development and training. This case organization is also investing in hiring, which is indicated in the *HCROI*(2) index.

	2005	2006	2007	2008	2009
Organization size (TFE)	965	1065	1168	1226	1251
Revenue	451 911 944	475 852 091	541 894 905	604 973 403	605 270 177
Employee costs	28 006 197	30 918 841	33 754 922	35 360 154	36 080 071
Sales Margin	76 584 648	78 896 801	87 967 022	95 569 481	97 770 252
Sales Margin %	16,95 %	16,58 %	16,23 %	15,80 %	16,15 %
HCROI	**2,73**	**2,55**	**2,61**	**2,70**	**2,71**
HCROI(2)	**2,87**	**2,82**	**2,86**	**2,84**	**2,76**
OSVA	**2,31**	**2,30**	**2,35**	**2,40**	**2,39**
Organization development cost savings	**903 824**	**1 699 996**	**2 350 070**	**2 393 511**	**2 169 440**
Outsourcing costs	37 011 588	38 972 286	44 381 193	49 547 322	49 571 627
Own development work cost	170 138	300 531	411 728	432 314	440 960
Change in organization size	5 %	10 %	10 %	5 %	2 %
HCROI change	0 %	-7 %	2 %	4 %	0 %
OSVA change	0 %	-1 %	2 %	2 %	-1 %
Sales Margin change	0 %	3 %	11 %	9 %	2 %
Revenue change	0 %	5 %	14 %	12 %	0 %
Growth profitability (Revenue*HCROI, index 1)	1	0,98	1,14	1,32	1,33

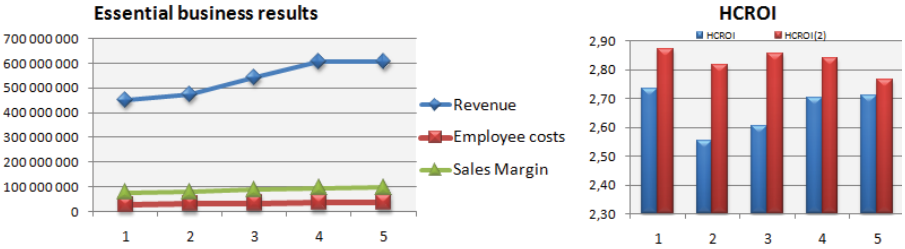

Fig. 7. Business results scenario

2.6. Case study: municipal organization scenario analysis. The public sector case analysis here considered concerns a Finnish municipal organization of around 1300 employees. The organization faced the challenges of improving productivity, while state funding was decreasing and the community's need for services increasing (a not unusual combination of demands on public agencies globally today). The local workforce is getting older, correlative with annual staff retirement rates of two percent. At the same time, staff costs including compensation were getting higher due to a rising consumer price index and other factors. Employee absenteeism was high, averaging eight percent, making for costly overtime work and staff replacement arrangements. In this instance, our scenario analysis indicated that productivity could be improved with the right investments in human capital.

	1. year				
Organization size (FTE)	**1327**	kpl			
Operating capacity (revenue)	107 753 400	€			
Gross margin (sales margin)	66 613 600	€			
Employee costs	54 381 866	€			
Estimated quality costs from revenue	6,0 %				
		2. year	3. year	4. year	5. year
New worker average work orientation time	5,0	5,0	5,0	5,0	5,0
Labour cost increase per year	3,0 %	0,0 %	2,0 %	3,0 %	3,0 %
Business area market change per year	0,0 %	0,0 %	0,0 %	0,0 %	0,0 %
Additional labour costs from total costs	21,5 %	21,5 %	21,5 %	21,5 %	21,5 %
Increase of personnel-%	0,0 %	-2,0 %	-2,0 %	-2,0 %	-2,0 %
Average personnel absence (%)	8,08 %	7,9 %	7,7 %	7,3 %	6,8 %
Personnel annual transfer (%)	17,00 %	16,7 %	16,2 %	15,4 %	14,3 %
Personnel training	0,5 %	0,6 %	0,7 %	0,8 %	0,9 %
Continuous performance development	0,5 %	0,6 %	0,7 %	0,8 %	0,9 %
Management competence	71,0 %	74,3 %	77,9 %	81,5 %	84,9 %
Leadership competence	71,0 %	74,3 %	77,9 %	81,5 %	84,9 %
Operating culture competence	71,0 %	74,3 %	77,9 %	81,5 %	84,9 %
Skills	71,0 %	74,3 %	77,9 %	81,5 %	84,9 %
Process competence	71,0 %	74,3 %	77,9 %	81,5 %	84,9 %
Outsourcing	33 583 000	34 429 070	35 459 661	36 529 742	37 527 709
Revenue change %		2,5 %	3,0 %	3,0 %	2,7 %

Summary of initial data	1. year	2. year	3. year	4. year	5. year
Personnel (FTE)	1327	1300	1274	1249	1224
Personnel transfer (pcs)	0,0	-26,5	-26,0	-25,5	-25,0
Number of new employees (pcs)	225,6	217,4	205,9	191,7	175,4
Number of terminated employment (pcs)	225,6	243,4	231,4	216,7	199,9
Absence days per employee (days)	19,9	19,6	18,9	18,0	16,8
Training time per employee (days)	1,2	1,5	1,7	2,0	2,2
Performance improvement per employee (days)	1,2	1,5	1,7	2,0	2,2
Revenue	107 753 400	110 468 076	113 774 799	117 208 227	120 410 276
Staff costs	54 381 866	53 294 229	53 167 093	53 569 173	53 984 986
Sales Margin	66 613 600	68 291 824	70 968 587	73 937 028	76 952 069
HCROI	**1,22**	**1,28**	**1,33**	**1,38**	**1,43**

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Fig. 8. Municipal organization scenario analysis initial data

Analysis indicates that three factor sets are simultaneously impacting productivity:

- rising absenteeism increase staff costs and quality costs;
- too high staff turnover rate is hindering the organization's human resource capacity;
- high retirement levels are diminishing organizational capacity and competencies.

Because these factors are related to each other, they should be analyzed together. The organization needs systematic organizational development with a strategic focus on these critical factor sets. The ensuing positive scenario is based on the assumption that each working unit succeeds in the competence-development and capacity-building process. This means that each working unit implements 3 to 4 optimizing improvement actions yearly, with the support of strategic corollary actions. One recommended strategic action is a bonus system aimed at workgroup productivity improvement. The bonus can be, for example, a 0.7 percent salary tied to corresponding successful implementation of at least three complementary productivity initiatives at the level of work unit or team. This bonus system has in fact been tested at this organization with promising results. Increased competency and capacity levels have offset the previously mentioned two percent per year attrition in staff.

	1. year	2. year	3. year	4. year	5. year
Organization size (FTE)	1327	1300	1274	1249	1224
Absence	8,1 %	7,9 %	7,7 %	7,3 %	6,8 %
Training and orientation	3,5 %	3,5 %	3,4 %	3,2 %	3,0 %
Training	0,5 %	0,6 %	0,7 %	0,8 %	0,9 %
Vacation	11,7 %	11,8 %	11,8 %	11,8 %	11,8 %
Own development time	0,5 %	0,6 %	0,7 %	0,8 %	0,9 %
Other working time (e.g. waste labour)	21,9 %	19,4 %	16,7 %	14,1 %	11,5 %
Effective working time	53,7 %	56,2 %	59,0 %	62,1 %	65,1 %
	100 %	100 %	100 %	100 %	100 %

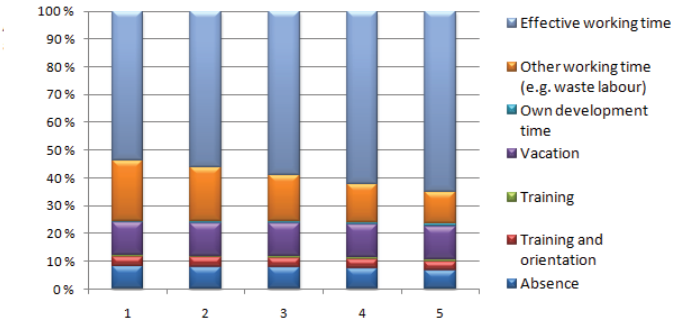

Fig. 9. Case-study organization's worktime distribution

Our scenario analysis projections indicate that the cost savings per year average 800 000€ per year, or about 640€ savings per employee annually. These savings come from reduced quality, absenteeism, and staff turnover costs. For example, in one organizational unit overtime and staff replacement were almost half of total regular staff costs. The absenteeism cost calculation was that one day's absence cost 278€, so that if each employee has one day less absence the organization will save 344 000€. However, various forms of slippage will inevitably undercut these gains, cumulatively by years four and five, so that at year five the organization has ten percent lower operational capacity compared to the projections of the positive scenario.

Nonetheless, scenario analysis encourages the organization to invest in human capital. When this investment is done effectively, it is possible to achieve these returns on investment of around 100€ per employee per year.

2.7. Case study 2: an industrial company with a staff ageing challenge. The industrial company in question has approximately 500 employees whose average age is 43. According to its age distribution, it is probable that almost 100 of the firm's employees will retire during the following decade. Therefore, the company is facing a margin of two percent additional staff reduction per year due to ageing. This means that more new workers than otherwise would be needed to compensate the retirement-related loss in human resource capacity. Other productivity factors include marginal individual productivity losses with ageing and approaching retirement; these may translate into workload reductions for those workers as they near retirement, so as to maintain productivity/worktime levels. The alternative is likely to be rising absenteeism rates among these employees.

HCROI scenario – analysis was conducted for two contingencies − a negative scenario and a positive scenario. The negative scenario is premised on the company taking no action to specifically address the looming ageing problem. In the positive scenario, strategic and operational interventions consistent with the recommendations made throughout this paper are planned and implemented, including improvements in staff training.

The positive scenario indicates that after five years the revenue is 22.7 percent better and sales margin 28.0 percent better than in the negative scenario. In both scenarios the average salary costs are the same, but in the positive scenario the staff costs are 7.7 percent lower. This is due to the sustainable growth of revenue per employee, so that these gains are made possible with reduced staff levels (due to ageing). By five year, staff costs per employee are five percent lower in the positive scenario.

Conclusion

The successful use of scenario analysis just described for an industrial organization and a municipal organization − spanning, therefore, the private

and public sectors − may be replicated in virtually any organization irrespective of business focus or sector. Much the same results, for instance, have been attained in a design company business unit, and in other settings.

These case studies confirm anticipated gains from scenario analysis, as postulated at the outset in this paper. In a wide variety of organizational contexts, employees have been found to identify much the same essential factors as entailed in the best interventions: (1) facing problems squarely, and correcting them; (2) learning and training at work; and (3) improved cooperation among units and departments.

Our findings suggest that for improved organizational performance management needs scenario-based OI, with applied analytics aimed at really see the firm or agency's overall profitability and/or productivity situation from a strategic point of view. Then there has to be action that is in line with this strategic visioning. Syväjärvi and Stenvall (2010) have showed that both private and public sector organizations may build functional scenarios for productivity improvement. Our paper has focused specifically on *human capital* scenario analysis as an OI tool. Well-executed applications in the field of organizational intelligence may help establish a new organizational philosophy, set new objectives, provide better personnel policy, and establish outstanding management procedures (Hamlin, 2007).

If well implemented, scenario analysis is also a superior method for the evaluation of stand-alone risk. Our research suggests that it is in many ways more practical and serviceable than sensitivity analysis, break-even analysis, Monte Carlo simulations, and other projective methods. In contrast to these variable-by-variable approaches to strategic management, scenario analysis assumes that uncertain factors do not operate independently from one another. As such, scenario analysis allows analysts to cluster various factors in commonsense, realistic, and consistent combinations. The analyst may reduce contingent organizational paths to the most likely positive and negative scenarios, without loss of realism or projective power.

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