Information pathways for the competence foresight mechanism in talent management framework

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Abstract

Purpose – The purpose of this paper is to contribute to the research and literature through the development of the theme of competence foresight. In addition, the aim is to construct information pathways for the foresight mechanism, for the use of practitioners, to enable them to manage talent and competences with an anticipatory perspective.

Design/methodology/approach – The research strategy is theoretical research with interpretive concept analysis approach. The research compares, compiles and combines theories and perspectives of strategic human resource management and development, talent management, competence management and foresight.

Findings – The results combine the information pathways and elements of the pathways for the competence foresight mechanism. The main three pathways in the mechanism are the pathways for detecting the needed competences for strategy implementation, the pathways for detecting rapid changes and the loss of competences.

Research limitations/implications – As talent management frameworks are organization specific, so are the mechanisms and information pathways for competence foresight. The results can be adjusted and developed to fit into other organizations.

Practical implications – The analysis and results provide the practitioners in human resources with new perspectives to use systematic foresight processes in talent management and development. The results can also be used for modelling the information pathways for the competence foresight mechanism in talent management software.

Originality/value – The research on human resources development and talent management does not deal with competence foresight. This paper addresses this deficiency and brings new, valuable perspectives of foresight and future studies for researchers and practitioners. This paper challenges further research on various aspects of competence foresight.

Keywords Competences, Human resource management, Competence foresight,
Information pathways in foresight mechanism, Talent management and development,
Strategic human resource management

Paper type Research paper

Introduction

It is a paradox that in the research and practice of talent management and development the foresighting of competences has been left in the background. Due to the increasing importance of competences and talent in the futures of organizations and nations, competence foresight should be considered with intense care.

The key dimensions and perspectives to competence in this research are based on the definitions by Mulder *et al.* (2009). The present research emphasizes the perspective that the concept of competence and also individual competences are socially constructed. Competences are dynamic, object of change and context dependent in

certain cultures, professions, organizations, tasks, roles and situations. These characteristics of competences challenge the practitioners in human resources (HR) to understand and develop competence foresight mechanisms for organizations. The compact and permanent conceptions of competences are no more relevant. The researchers of talent management (TM) and human resources development (HRD) issues need to construct new concepts, models and theories since, today, foresight and HR theories and concepts have too few interests in common.

Major *et al.* (2001) discuss foresight and the characteristics of managerial attitudes. The researchers suggest that reactive organizations have zero or low foresight knowledge, while responsive organizations have moderate knowledge and a few resultant actions. Strategic organizations have high-level foresight knowledge and foresight practices. Today, when talent is increasingly valuable to the organizations, many have realized the need for systematic human resource planning, which depends on successful foresight processes. Especially the dynamics of talent and competences becomes more important and the ability to make deductions by responding to rapid changes depends on the ability to read and interpret weak signals and to anticipate black swans.

Today, the ensuring and development of talent is highlighted in the TM and HRD practice and research. The insufficient research on competence foresight might result from the undefined concepts. Foresight is a rather new concept and only a restricted amount of specialists work with the issue in research and practice areas. Competence foresight is a fuzzy concept combined from two fuzzy concepts. The present research enhances the conceptual understanding of foresight in the context of strategic human resource management.

This paper aims to consider the role of competence foresight in talent management framework. In the paper, talent management framework constitutes of a larger entity where the three core elements are foresighting, planning and ensuring talent.

The research question is: what are the pathways for the foresight mechanism in foresighting competences in the context of strategic human resource management? A pathway in this context includes the definitions of competence type, input information type and sources, methodology of information gathering, point of time for competence examination and integration to competence management software. The research strategy is theoretical research with interpretive concept analysis approach. The research compares, compiles and combines concepts and theories, as well as principles and perspectives of strategic human resource management and development, talent management, competence management and foresight.

The interpretive concept analysis approach has been chosen because the common base knowledge and practices are not adequate to solve the real life problems of competence foresight mechanism. The interpretive concept analysis in this research combines the features of talent, competence and foresight. Both textual and empirical sources are used in the analysis. The concept definition is significant not only for theoretical use; it is also a tool for practitioners (Nuopponen, 2003). In the present research, practical knowledge interest is emphasized.

The methods and mechanisms for competence foresight have neither been discussed in HRD or TM literature, nor implemented systematically in practice. The definition of competence foresight by Siikaniemi *et al.* (2010, p. 23) is the key concept in this paper. According to the researchers, competence foresight begins with identifying the focal future change factors, and it results in the management of changes of the

organization's and individual's competences. The key dimensions of competence foresight are the time-span, context, dynamics and networking of foresight, which all outline the foresight process.

The dimensions of competence foresight provide new perspectives to the research and practice of competence foresight, HRD and TM. The model is based on theories and careful examination of both competences and foresight. The foundation for the foresight mechanism is in the foresight process by Horton (1999), which is a widely used and valued model in future studies. She describes the three phases of a successful foresight process. Each of the three phases creates a greater value than the previous one. The outputs of the phases describe the information value chain, which develops from information through knowledge to understanding and subsequent activities. Horton's foresight process is discussed in detail in the theoretical context section.

Talent management is often too united with strategy implementation. Siikaniemi *et al.* (2010) bring up that the dynamic environments also require for ever higher degree foresighting, which contributes to innovations. The mechanism of competence foresight can hinder or encourage innovations in an organization. Thus, the mechanism itself should be open and promote dialogue, which contributes to learning and change.

Theoretical context

This section discusses the key theories and perspectives used in the textual sources of the interpretive concept analysis. The beginning of the section discusses strategic human resource management theories and perspectives by, e.g. Hall (1984) and Laakso-Manninen and Viitala (2007), talent management perspectives by Fegley (2006), Ford *et al.* (2010) and Lewis and Heckman (2006), as well as competence and competence management theories and perspectives by Mulder *et al.* (2009), Sanchez and Heene (2004) and Teece *et al.* (1997). The second part discusses foresight theories and perspectives by, e.g. Coffman (1997), Hiltunen (2007) and Horton (1999) and the concept of competence foresight by Siikaniemi *et al.* (2010).

This research does not highlight only HRD or talent development theories and practices. HR practitioners and also researchers have to recognize that, in unexpectedly changing contexts, human resources development and management functions have to develop new common working methods, concepts and models in order to promote the competitiveness of organizations (Siikaniemi, 2009a).

Strategic frameworks for competence foresight

The key perspectives and principles in this paper are related to strategic human resource management and talent management architecture. Lewis and Heckman's (2006, p. 152) approach emphasize on talent management architecture and its significance in a strategic decision framework. Ford *et al.* (2010, p. 6) bring up the key features of TM; they highlight the orientation towards a dynamic future and note that talent management and development should be adjusted so that they always align with strategy, are continuously evaluated and are tailored both for organizational and individual needs. The perspectives of both organizations and individuals are important in TM and also in competence foresight. Often the strategic frameworks forget the individuals, the talents, who actualise the strategies.

Strategic human resource management theories differ from the other human resource management theories in that they have powerful and prominent links to the

implementation of the strategy of the organization. Sanchez and Heene (2004, p. 38) discuss the competence-based approach to strategic management. The approach points out that the competence perspective produces strategies that can be effective in responding to the dynamic, systemic, cognitive and holistic nature of organizations and their environments. Devanna *et al.* (1984, p. 51) assert that the quality of the strategic decisions made in the organizations' business strategies is linked to the quality of the human resources data that feeds into the decision-making process.

In the global competition, which is about individual workers and their competences rather than products of the factories (Baldwin, 2006), TM is becoming the fundamental issue. The key questions for the research and practice of TM today are:

- How does an organization ensure that talent is aligned to support the current strategies, is adaptable to new strategies and is able to influence new strategic directions?

- How does an organization actively build and continuously renew strategic human and organizational resources to fuel competitive advantage? (Colbert, 2007, p. 101).

Influencing the future and new strategic directions of the organization is an advanced aspect and should be highlighted in the discussions and research of talent management and development.

Too much strategizing is not recommended. This means that a too exaggerated engagement to strategy can lead to the neglect of rapid environmental changes, which could have an effect also on the rapid and dynamic changes in TM (Teece *et al.*, 1997). Sanchez and Heene (2004) discuss strategic flexibility, which is constituted of resource flexibility and coordination flexibility. They assert that strategic flexibility is an integral part of the competence view of strategic management in dynamic environments. Dynamic environments produce and require dynamic competences.

Salojärvi (2009) discusses that in new evolution trends the reality of organizations is created with talent management and various discourses. In this postmodern approach of talent management, TM creates a context for the rest of the management of the organization, not vice versa. Postmodern autonomous TM promotes gallant discourse, which seeks new possibilities and solutions for unexpected situations. Successful competence foresight can strengthen this approach.

Key perspectives to competence

The concept of competence has different meanings. The key dimensions and perspectives to competence in this research are based on the concept by Mulder *et al.* (2009, p. 757). The researchers state that competence is: the integrated set of capabilities (or competencies); consisting of clusters of knowledge, skills, and attitudes; necessarily conditional for task performance and problem solving; and for being able to function effectively (according to certain expectations or standards); and in a certain profession, organization, job, role and situation. Lans *et al.* (2005) extend the concept with the following perspectives: competences are context-bound, subject to change, connected to activities and tasks, subject to learning and development processes and interrelated. These perspectives are shared by several other researchers. Brandes and van der Zee (2008) assert that competence refers to the proven ability to use knowledge, skills and personal, social and/or methodological abilities in work or study situations

and in professional and personal development. Jonnaert *et al.* (2006) emphasize the situational approach to competences. They point out that competences can only be defined in relation to situations, and that they are situated in a particular physical and social context. The present research emphasizes the perspective that the concept of competence and also individual competences are socially constructed. Competences are dynamic, object of change and context dependent in certain cultures, professions, organizations, tasks, roles and situations.

Thus, the models and activities of TM are and always should be context and organization dependent. This approach is often ignored in practice when organizations build their talent management and development routines. They prefer to take ready-made competence taxonomies from other organizations without the examination of their own strategy and future needs. Likewise, once the competences have been described, the organizations are satisfied and get back to examine them after several years. Competences are dynamic and have their life cycles.

Boam and Sparrow (1992) have categorized competences according to their importance at different times during an organization's life cycle. The four categories are:

(1) core;

(2) maturing;

(3) transitional; and

(4) emerging competences.

Core competences are continuous and remain stable, while maturing competences have played an important role in the past but have currently a less prominent impact. Transitional competences are relevant only for a short period of time and emerging competences will become increasingly important in the future.

The foresight of the competences of an organization or a personnel group of an organization should consider all the above-mentioned competences and, in addition, the loss of competences due to, e.g. retirement and workplace changes. In this research, the competences under examination are divided into three main categories, which are:

(1) core competences;

(2) dynamic competences; and

(3) loss of competences.

These are explained carefully afterwards.

Key aspects in talent management framework
Lewis and Heckman highlight that, by grounding TM in a strategic decision framework, talent decisions are clearly guided (Lewis and Heckman, 2006, p. 152). Campos and Sanchez (2003, p. 14) share this assumption and assert that competence management is one of the basic elements of an organization's strategy process. The focus of TM from the perspective of strategic human resource management today is how the organization plans, manages, organizes and develops its personnel so that it could fulfil the strategy and upgrade its market position (Laakso-Manninen and Viitala, 2007).

According to Hall (1984, p. 159), strategic human resource development can be defined as the identification of needed skills and active management of employee

learning for the long-range future, which are related to explicit corporate and business strategies. The definition of Hall is up-to-date in that it brings up also the aspect of employee learning management. Hall (1984, p. 160, p. 181) asserts that the strategic pursuit of HRD is one of the least developed areas of human resource management. The development work in organizations fails to be strategic, as the time span is often too short and there is too much training and not real future-oriented development and learning. In 25 years, the practices have developed to some extent but they still remain in many cases as a set of formal educational activities.

The TM framework by Siikaniemi (2009b) is a framework, which has been constructed for practical use in an expert organization. The framework is based on theoretical and empirical data and shares the theories and perspectives described in this research. The framework (Figure 1) constitutes of the TM entity. The basis is in the strategic human resource management.

Source: Siikaniemi (2009b)

Figure 1.
Talent management
framework

www.man

The various definitions of TM indicate that there is not any exact definition of it. As a summary of the definitions, in this research TM constitutes of a larger entity in which the three main aspects are foresighting, planning and ensuring competence. Every main aspect has several sectors, processes, sub-processes and frameworks. In practice, the borderline and concepts of the main aspects and processes depends on the organizational comprehension and decisions, while in scientific research the borderline depends on different research approaches and theories.

Talent planning – an underestimated process
Talent planning, one of the key aspects of TM framework, can simply be defined as the planning of the qualitative and quantitative demands of the talent of the organization in the future. The basis for the planning should be in the organizational strategy. Talent planning is often conceived as the planning of financial resources or as the operative planning of, e.g. the sketching and coordination of work shifts. Thus, the strategic perspective and competence perspective in planning often remain unclear and underestimated in organizations.

A broad definition of talent planning can be specified as the forecasting of future business and environmental demands of the organization and the adjustment of the personnel requirements to those conditions. However, this is implemented poorly in practice. Lengnick-Hall and Lengnick-Hall (1988, p. 457) suggest that the reason for this might be the fact that most research on human resource planning focuses on forecasting the supply and demand of resources. Thus, the planning is mostly statistical and only a little thought is given to the utilization of the outcomes. The early literature on talent planning (e.g. Hall, 1984) uses the concepts of forecasting and anticipating, which usually refer to statistical practices and research. The concept of foresight, which is used in this research, has been first considered in the late 1990s. The concept is defined in more detail in the next section.

Hall's (1984, p. 172) model describes human resources forecasting. The model includes the following sectors:

- losses;
- back-up;
- future demand; and
- imbalance of competences.

The sources for losses are retirement, transfer out of function and resignations. The sources for back-up are: talented people through mobility and career development preferences from managers and employees. Strategic and operational business plans are the sources for future demand. In Hall's model, the imbalance in competences (surplus or shortage) will lead to action plans for development, recruitment and reassignment.

A comprehensive talent planning entity comprises of sectors such as the planning of future needs for talent (amount, competence needs, occupations and occupational structure, occupational requirements, educational structure, age structure, gender structure etc), estimation of loss due to retirement and workplace changes, positioning of occupations in regions, assigning of personnel to occupations and positions in the organization, development and transition of competences as well as career planning and wellbeing of the personnel (Finnish Ministry of Finance, 2005.)

The talent planning entity of the Finnish Ministry of Finance (2005) contains analogous sectors with Hall's (1984) model. For instance, they both contain the aspect of the loss of competences, which is a rare concept in other TM frameworks. All in all, the linkage to foresight as the foundation for talent planning is almost non-existent, and there is not sufficient research on the phenomena.

Concepts, frameworks and processes of foresight
The concepts of foresight and futures studies (also called futures research) are close to each other. The concepts both use the same theories and methodology. The main difference is that foresight is doing, using and interacting, while futures studies are more science dependent. The focus in foresight is the active search for means, practices and working methods to direct the development work in organizations into the preferable direction (Aalto, 2007).

The European Foresight Monitoring Network defines foresight as follows: "foresight is a participative approach to creating shared long-term visions to inform short term decision-making processes" (www.efmn.info). The significance of foresight is highlighted by Horton (1999), who introduces foresight as a key business skill. She asserts that foresightedness is a combination of the developing of understanding of possible futures for an organization and acting upon that understanding (Horton, 1999, p. 5).

Stakeholders have a prominent role in foresight processes. Fuller and Smedt (2008, p. 1) point out that foresight is a professional practice that supports significant decisions. It is practiced across many domains and is not the preserve of specialised "futurists" or foresight specialists. The results of foresight are needed for practical purposes such as management, strategies, policies, planning, design, roadmapping, action and decision-making (Malaska and Holstius, 2009, pp. 86-87).

Fuller and Loogma (2009) bring out a new perspective to foresight. The researchers discuss the social constructionist perspective of foresight methodology and suggest that foresight is both a social construction and a mechanism for social construction. The introduction of this perspective is significant, since many activities in the foresight process require human sources, participation and networking (Hiltunen, 2007; Kaivo-oja *et al.*, 2004). A report of the High Level Expert Group for the European Commission (European Commission, 2002) also discusses a socially constructed future. The report suggests that future is something shaped by people through their purposeful acts.

Foresight is a professional and also practical process, which can be better understood by illustrating and opening the frameworks and processes in more detail. Uotila and Melkas (2007, p. 112) have studied the quality of data, information and knowledge in regional foresight. According to them, future-oriented considerations are not routine tasks. That is why the data, information and knowledge should be of good quality. Uotila and Melkas also note that improving the quality of knowledge requires a holistic approach to the entire foresight process. The framework by Horton (1999) is one of the most widely used and thoroughly explained foresight frameworks.

Horton (1999, p. 6) describes the three phases of a successful foresight process. The process presented in Figure 2 is modified from Horton's process by Siikaniemi *et al.* (2010, p. 17). The phases are the same as Horton's but the overview of the process is more dynamic. Each of the three phases creates a greater value than the previous one.
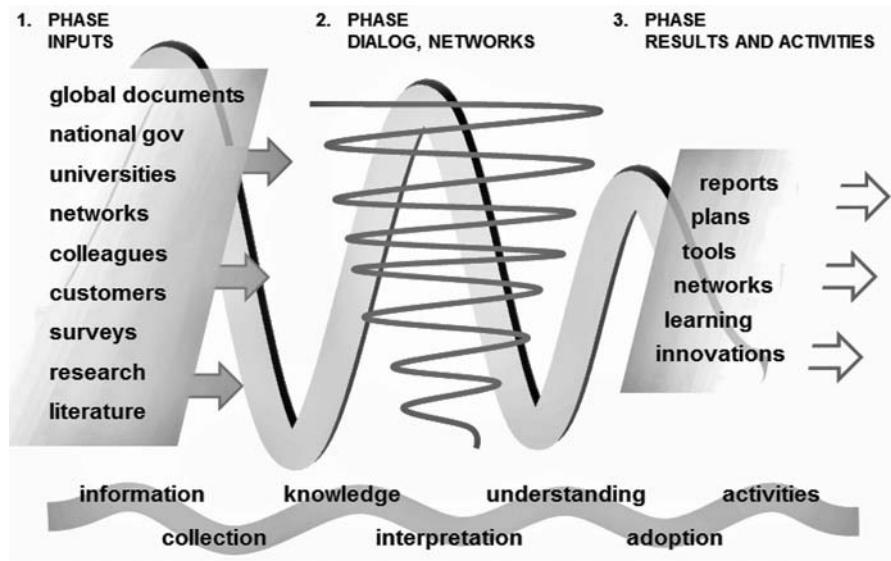
Source: Siikaniemi *et al.* (2010, p. 17) modified from Horton (1999, p. 6)

The outputs of the phases describe the information value chain, which develops from information through knowledge to understanding via the subsequent phases in the process. Phase one comprises the collection, collation and summarization of available foresight information and results in the production of foresight knowledge. Phase two comprises the translation and interpretation of this knowledge into an understanding of its implications for the future. Phase three comprises the assimilation and evaluation of this understanding to produce a commitment to action in a particular organization.

The information about futures themes, top ten lists, trends, megatrends, ideas, weak signals and wild cards is collected from a wide range of sources that can be human sources or textual sources. The sources include experts, universities, business networks, personal networks, customers, suppliers, literature, government, other foresight reports, research and surveys. The methodologies and processes that can be employed in information collection are also versatile. One can choose from methodologies such as environmental scanning, Delphi surveys, systematic reading, brainstorming sessions, abstracting or simply talking to people (Horton, 1999, p. 6).

In the second phase of the process, translation means that the knowledge summarized in phase one can be in a variety of languages (technical, economic, social, legal, educational, environmental, foreign, even incomprehensible) and this needs to be translated into a language that is understood by the organization (Horton, 1999). Interpretation is the key step of the foresight phase. The translated knowledge is converted into understanding and this requires interpretation into issues, road maps, views or scenarios of the futures that are relevant to the organization. The essence of the process is to answer the questions: what does all this mean for the particular organization, what are the implications for us, and what can we do about it today? In this research, the focal question is: what does this mean to talent management and

what are our future competence needs? Horton (1999, p. 7) points out that interpretation is the most crucial step in the foresight process, although it is often poorly understood and has only a few theoretical techniques.

Phase three is important especially from the management and decision-making perspectives. Horton (1999) asserts that there is no point in implementing the foresight process unless something different happens as a result.

Siikaniemi *et al.* (2010, p. 18) present the key features of foresight, which are:

- focus is on long-term and medium-term time span;
- emerging questions are considered extensively and from various aspects;
- proceeding in phases and exploiting diverse methods;
- promoting of interaction; and
- information in value chain transforms into activities through understanding.

The definition and processes of competence foresight need the examination of both of the concepts, competence and foresight. Based on this examination, Siikaniemi *et al.* (2010, p. 23) have defined competence foresight as follows: competence foresight begins with indentifying focal future change factors, and it results in the management of changes of the organization's and individual's competences. The key dimensions of competence foresight are the time-span, context, dynamics and networking of foresight, which all outline the foresight process. The core of the dimensions of competence foresight is illustrated in Figure 3. The key questions in competence foresight are "what to foresight" and "how to foresight". Before beginning the foresight process, each organization needs to consider these issues thoroughly.

Constructing information pathways for the competence foresight mechanism

The objective of the construction of the foresight mechanism and information pathways is to present a useful framework for the use of practitioners and researchers. The pathways aim to describe the information that is important for the input of a foresight mechanism for chosen competence categories. The complete foresight mechanism also describes how the information should be translated and interpreted to get the appropriate outcome. This research focuses on the information pathways for the foresight mechanism. In this analysis, an information pathway includes the following elements for special competence categories: input information types and sources, methodology of information gathering, point of time for examination and integration to TM software (TMS).

In this conceptual analysis, the competences under examination are divided into three main categories, which are:

(1) core competences;
(2) dynamic competences; and
(3) loss of competences.

The key aspects and theories of these competence categories are concisely discussed in the following sub-sections. In the end of each sub-section, the aspects of information
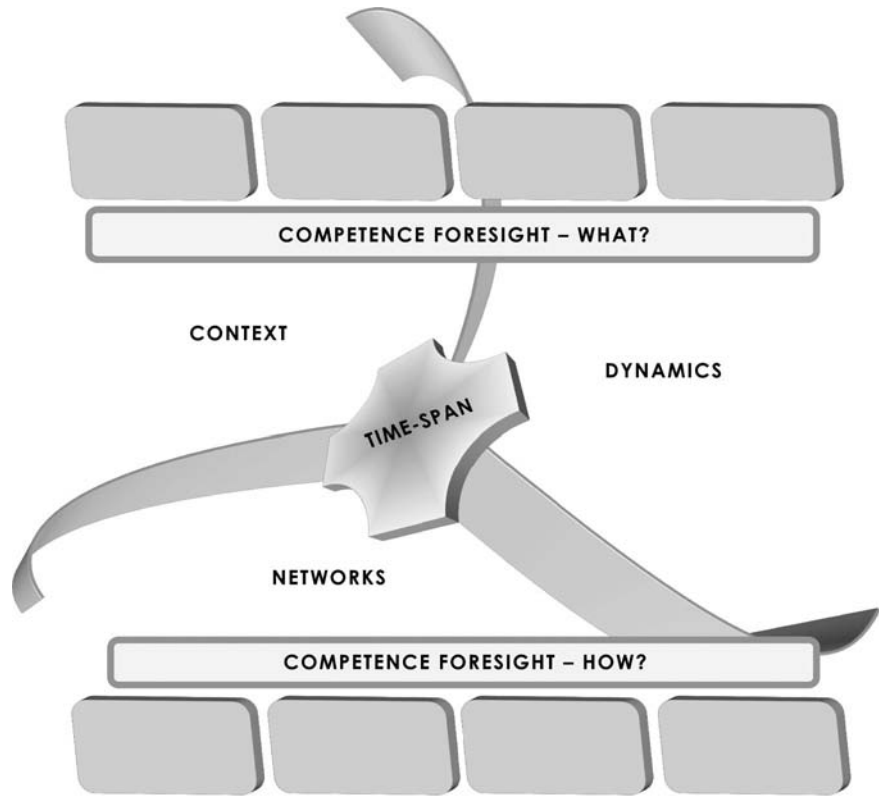
Figure 3.
Dimensions of competence
foresight

Source: Modified from Siikaniemi *et al*. (2010, p. 25)

pathways are summarized. The elements of information pathways for each competence category are combined into Figure 4.

Information about the core competences
Core competences are the basis of the competitive advantage of an organization; this also applies to an educational organization. Hamel and Prahaland (1994, p. 219) define a core competence as a bundle of skills and technologies that enable a company to provide a particular benefit to customers. Thus, the organization should not be considered as a portfolio of products or services, but as a portfolio of competences (Hamel and Prahaland, 1994, p. 243). According to Teece *et al.* (1997, p. 516), the core competences must be derived from the organization's products and services and, thereby, core competences define an organization's fundamental business as a core.

Hitt *et al.* (2009, p. 71) highlight the significance of core competences and environmental changes when they describe the competitive advantage of an organization. The aforementioned description also brings out the perspective of dynamic competences, which is discussed in more detail in the following sub-section. To apply core competences in practice requires advanced strategic human resource management, talent management and active dialogue of competences in the

Competence type	Input information type and sources	Methodology of information gathering	Point of time of examination	Integration to TM software features
Core competence				
	• existing strategy of the organization • evaluation information of organizational functionality (e.g. quality audits) • regional, national and international educational strategies • regional and national business and innovation strategies • forecasts of labour market supply and demand • research and surveys of labour market trends • research and surveys of competence needs of labour market • megatrends, top ten lists The sources of information are textual sources by the top management, experts and researchers. Human sources are e.g. networks, colleagues, customers.	Information from textual sources is collected and the information for core competence examination is produced by content analysis methods. Information from human sources in the strategy thinking and planning processes is often gathered by brainstorming and discussions.	During strategy building and evaluation process, which is performed one or two times a year depending on the education sector and environmental changes.	The needed changes of core competences are defined according to the strategic objectives and success factors. The new and constant core competences are made apparent in the typology of competences in the TM software.
Dynamic competence				
Emerging	• weak signals, wild cards, ideas • evaluation information of organizational functionality (e.g. quality audits)	Active discussion with personnel and networking with experts, colleagues, researchers etc. Systematic reading and following the future trends discussions. Active evaluation of the organizational functionality.	Continuous scanning of the environment. Development discussions with the personnel according to the organizational yearly cycle. Individual discussions and group discussions.	TM software contains a platform in the competence evaluation section and development discussion section to bring out prominent signals of emerging competences which are important for the organization's future.
Transitional	The sources of information for weak signals are mainly human sources (experts, futurists, colleagues, scientists/researchers, networks) and also textual sources (academic and scientific journals, scientific and economic magazines).			
Maturing	• the input information is comprised of the same issues as in the core competence examination above.			
Loss of competence				
Retirement	• individual's and organization's competences in databases • reports and documents of competence management (e.g. competence evaluation) • evaluation information of organizational functionality (e.g. quality audits)	Textual information is brought up from databases and documents by content analysis methods. Various discussions and interviews.	Development discussions with the individual, in which the point of time is set according to the planned retirement. The discussions contain special consideration of tacit knowledge.	TM software contains development discussions section and competence evaluation section.
Change of function due to • *organizational changes* • *job rotation*	• process descriptions of the organization's processes The sources of information are textual sources such as documents and databases. The information is constructed by individuals, management and experts in human resources in various discussions.		The point of time is set according to the organizational change processes. In the case of job rotation, the discussions are scheduled individually.	TM software contains development discussions section, competence evaluation section and a section for job rotation.
Resigning			Development discussions with the personnel. The point of time is scheduled individually in the leave discussions.	TM software contains development discussions section, competence evaluation section and a section for leave discussions.

Figure 4.
Elements of the information pathways for the foresight mechanism of an expert organization

organization. Thus, the information for defining an organization's core competences should be produced in the organization's strategy building process. More specifically, the information should be produced in the phases of strategy thinking and planning (Voros, 2003). In the background of the strategy thinking and planning processes, there are often analyses of megatrends or top ten lists that are considerably permanent, provide a comprehensive future view and are easily available on the internet. For example, the foresight reports by the European Commission are available at http:// cordis.europa.eu/foresight/reports.htm Those reports aim to disseminate information that is relevant for both policy-makers at all levels and the foresight research community in order to exploit foresight knowledge produced in Europe and elsewhere.

When the TM framework of an expert organization follows the strategic human resource management procedure, the collection of information about the core competences is linked firmly to the strategy building process. Thus, the input information sources for core competences will be the following: the existing strategy of the organization; regional, national and international sector-specific strategies; regional and national business and innovation strategies; forecasts of labour market supply and demand; research and surveys of labour market trends; and research and surveys of the competence needs of the labour market.

These above-mentioned sources of input information for core competences are mainly textual sources produced by experts and researchers at the national, regional and international levels. The forecasts of competence needs, especially the quantitative needs, are produced at the national and regional level administration. However, the organizational foresight mechanism should have a strong link to these higher level mechanisms. It is essential to highlight that the qualitative competence needs are context specific for an organization, task, etc.

Information about the dynamic competences

Several researchers highlight the significance of dynamic competences. Teece *et al.* (1997, p. 516) have defined a dynamic capability/competence as "the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments." North (1990) notes that competences enable the organization to operate efficiently, whereas dynamic competences make it dynamically efficient. The claim for a continuously efficient organization appears as a threat for a part of the personnel, but it also challenges and motivates another part of the personnel. The threat is often associated with the talent level of an individual worker.

In this research, dynamic competences are referred to as competences that are not as stable or important as the core competences at present, but the probability that they might over time become core competences is high. In Boam and Sparrow's (1992) competence life cycle model, the emerging, transitional and maturing competences can be considered as dynamic competences because of their non-stabile features. They all require different kinds of input information from the foresight mechanism. Especially the emerging competences will become increasingly important in the future and, from talent management perspective, these are also the focal ones of the dynamic competences. Thus, the need for advanced foresight practices is inevitable. It is essential that the organization does not stay too fixed only to its core competences (Teece *et al.*, 1997).

While the megatrends and top ten lists are the basis for the input information in the definition of the core competences, weak signals are in a fundamental role when

looking for the dynamic competences of an organization. Coffman (1997) discusses the purposes of weak signals. According to him, a weak signal is, e.g. an idea or trend that will affect how we do business, what business we do and the environment in which we will work. Weak signals are sometimes difficult to track down and they can also introduce a threat or opportunity to the organization. Weak signals usually have a substantial lag time before they become mainstream and, therefore, they represent an opportunity to learn, grow and evolve (Coffman, 1997).

Hiltunen (2007, p. 18) has studied the sources of weak signals in Finland. According to her research, human sources, such as colleagues, scientists and researchers, futurists, consultants in areas other than futures and ordinary people were appreciated in the top ten lists of good sources of weak signals in the technology and science, economics, society and culture sectors. Textual sources, such as television/radio, academic and scientific journals, movies, popular science and economic magazines were also appreciated by the respondents. Of the online sources, the web sites of companies and organizations as well as electronic journals were appreciated.

In Hiltunen's international research (Hiltunen, 2007, p. 28) on the top sources of weak signals of changes in all areas of life, the number one source was scientists/researchers, which were followed by futurists, colleagues, academic and scientific journals, reports of research institutes, consultants in areas other than futures, popular science and economic magazines, television/radio, educational and scientific books and companies' or organizations' web pages. Thus, in the area of educational changes, the three most appreciated sources belonged to the category of human sources. Saikkonen *et al.* (2007) have also noted the significance of human sources in the construction of foresight framework for an expert organization. The researchers highlight networking and private contacts in information gathering.

Following Hiltunen's (2007) research, the input information of emerging dynamic competences will be received through weak signals, of which the sources are experts (futurists, colleagues, scientists/researchers), networks, academic and scientific journals as well as scientific and economic magazines.

The input information sources for transitional competences, which are relevant only for a short period of time, will be the same sources as in the recognition of emerging competences. According to Kaivo-oja *et al.* (2004, p. 544), information about the rapidly changing environments is discovered best by networking with people, as the transmission of information from interactions is faster than the transmission from textual sources, i.e. analysis or reports. Thus, the point of time for providing input information cannot be precisely determined and the input information collection must be continuous.

Maturing competences, which are also dynamic competences, can be considered as the old and vanishing competences, which might have been as important as core competences in the past. At least they have had at some point a great significance. Thus, the input information for the foresight mechanism of maturing competences will be examined in the same process as the input information for the core competences of the organization.

Information about the loss of competences
As the core competences and dynamic competences, the information about the loss of competences should also have significance for the organization. Hall (1984) defines the following sources of losses in human resources that should be taken into consideration:

retirement, transfer out of function and resignations. Especially today, when unusually large numbers of personnel are going to retire in the next few years, the loss of competences and tacit knowledge will be considerable. Today, the organizations that have not yet performed activities to preserve the irreplaceable tacit knowledge have lost valuable knowledge beyond retrieval.

The personnel and their competences that are transferred out of one function of an organization to another are also a loss for the first one of those functions. The organizational functionality framework by Hildén (2004) highlights that an organization is ultimately an arrangement of human competences. The organizational functionality framework is a combination of individual competence elements, collaborative elements and structural elements. The competence perspective of organizational functionality is, unfortunately, often left out in the examination of new organizational structures. Active discussion of competences also in the organizational change processes would be advantageous both for the personnel and the organization.

The input information about the loss of competences exists or should exist already inside the TM processes and the stored information of the competences of the personnel and organization. This means that when the organization is aware of the strategic human resource management processes, and has relevant activities as well as relevant information systems, it has the information of the competences in databases, reports and other documents. When an organization exploits the strategic human resource management, the competences of an individual person should be made prominent already in the recruitment phase and analysed, discussed and developed during the career. The competences should be entered into a TM software and database. Once saved, the competence information can be evaluated and shifted into further analysis when needed. However, the challenge is how to use the information and how to interpret it into knowledge.

The loss of competences, in the case of transfer out of one function to another in the same organization, is not as wounding as the loss of competences in resignations and retirement. The upcoming losses can be identified and evaluated beforehand in each case and the management can take actions to ensure the functionality of the organization. When the retirement of a person is approaching, the management faces a challenge in identifying the tacit knowledge the person has gained during his or her career. Tacit knowledge is rarely registered in a database and, thus, the knowledge of the structural and collaborative elements (Hilden, 2004) of the organization also assists in finding the upcoming competence losses. Another valuable but often unused input information source is dialogue and discussions with the personnel; information about tacit knowledge can be gathered, e.g. during development discussions.

Information pathways for the foresight mechanism
The advanced methodology of foresight recommends combining several sources of information and methods with each other (Aalto, 2007). This aspect is inevitable in the consideration of foresight information for TM. Figure 4 illustrates the elements of the information pathways for the foresight mechanism in an expert organization. These elements are: input information types and sources, methodology of information gathering, point of time for examination and integration to TMS. The TMS integration is central, since in the target organization TMS used as a tool for foresight information storing and retrieval.

The distinction to competence foresight in other business sectors can be found in the input information types, sources, methodologies and points of time. Fuller and Loogma (2009, p. 78) point out that, methodologically, the accuracy of knowledge is less significant than the process by which the knowledge is produced. However, as Uotila and Melkas (2007, p. 1,129) point out, information and knowledge should be of good quality.

The actual foresight is implemented after the organization has collected appropriate information. Horton (1999, p. 7) notes that the knowledge summarized from information in the first phase of the foresight process is in a variety of languages and, thus, needs to be translated into a language that is understood by the human resources practitioners and management. Horton discusses also the role of managers in the foresight process. He suggests that managers are not always the ones who understand what a change in the future external environment means for the future of their own organizations. Therefore, third parties are often essential for interpretation.

Discussion

The definitions, research and practices of competence foresight are inadequate to meet the challenges of the future TM and HRD. The aim of this research is to contribute to the HRD and TM research and literature through the inspection of the theme of competence foresight. In addition, the aim is to construct information pathways for the foresight mechanism for the use of HR personnel and the supervisors to enable them to manage talent and competences with an anticipatory perspective.

The present research emphasizes the perspective that the concept of competence and also competences are socially constructed. Competences are dynamic, object of change and context dependent in certain cultures, professions, organizations, tasks, roles and situations.

The dimensions of competence foresight by Siikaniemi *et al.* (2010) contribute to the perspectives of socially constructed, dynamic and context dependent competences. The key dimensions of competence foresight are the time-span, context, dynamics and networking. These key dimensions outline the foresight process. The foresight process in the present research follows Horton's (1999) foresight process and its three phases. Phase one comprises the collection, collation and summarization of available foresight information and results in the production of foresight knowledge. Phase two comprises the translation and interpretation of this knowledge into an understanding of its implications for the future. Phase three comprises the assimilation and evaluation of this understanding to produce a commitment to action in a particular organization.

The consideration of information pathways is needed for the competence foresight mechanism to understand and determine the organizational foresight processes. An information pathway in this context includes the following elements: the definition of competence type, input information type and sources, methodology of information gathering, point of time for competence examination and integration to talent management software.

The systematic thinking and planning of talent is an important part of constructing the future of the organization. One aspect of talent planning and HRD is the planning of competences. The future of competences cannot be planned or developed if the organization is not aware of its existing and future competences and competence needs. Thus, the foresight process is expected to produce the organization's HR personnel and

managers information, knowledge and understanding for decision-making of the future talent needs and what actions to take.

The conceptual analysis of this research leads into the conceptual construct of information pathways for the foresight mechanism in talent management framework. The conceptual analytical approach was implemented to obtain an adequate knowledge base of the phenomena so that the basis for the subsequent actions of competence foresight in the target organization would be comprehensive enough. The subsequent development work will be based both in theory and practice in a process where theory precedes good practice and good practice creates theory.

The results of the present research combine the information pathways for the competence foresight mechanism of an expert organization. The framework is developed for foresighting competences within a strategic human resources management context. The three main information pathways in the mechanism are the pathway for detecting the needed competences for strategy implementation (core competences), the pathway for detecting rapid changes in the environment (dynamic competences) and the pathway for detecting the loss of competences.

Figure 4 illustrates the elements of the information pathways for the foresight mechanism. The information types and sources, as well as the gathering, summarization and storing of the information all need to be systematic because of the substantial amount of information. However, the human sources of information are important and the process of social constructionism becomes more and more significant. Fuller and Loogma (2009, p. 78) highlight that social constructionism produces new knowledge, not as a matter of empirical discovery, but as a process of creation. The way in which knowledge is produced and used is central to foresight methodologies.

As TM frameworks are organization specific, so is the mechanism for competence foresight. The results can be adjusted and developed to fit into other organizations. The analysis and results provide the practitioners in human resources new perspectives to use systematic foresight processes in talent management and development. The results can also be used for modelling the information pathways for the competence foresight mechanism in TMS.

As a summary of the construction of the information pathways and its elements we can begin from the supply for competence foresight information. On one end we have diverse forums, times, sources and information systems in which we discuss, share, store and retrieve information about the competences of the organization and the individuals today and in the future. On the other end, we have the demand for foresight information, the strategy of the organization and the need to adopt TM, SHRM, SHRD and HRD to the requirements of the strategy.

Between these two ends we need frameworks and mechanisms to make the multilevel and complex processes visible. TM framework (Figure 1) includes three main aspects, which are foresighting, planning and ensuring competences. Competence foresight process is needed for the planning and ensuring of competences and development work. The information pathways provide information about the competences of the organization and the individuals to the competence foresight mechanism from diverse forums, times, sources and information systems. In dynamic and large organizations, TMS is needed to store and especially to process the enormous amount of competence information.

Voros (2003, p. 12) points out that foresight should not be a separate and special occurrence in an organization, but a permanent, continuous and normal part of the organization's planning and also a mainstream activity. This approach is apparent in the examination of the elements of the pathways in Figure 4. The input information is collected in normal organizational processes, e.g. in strategy planning and thinking process, development discussions process and competence evaluation processes.

The theoretical discussion of this research brings out the deficiency of foresight research and theories in the areas of TM and HRD. Also talent planning needs more research and theoretical examination. These areas should benefit from the research and theories on foresight and future studies. The issue of competence foresight presents new openings for research, for instance, in the following issues: competence foresight process and its phases, dimensions of competence foresight, competence foresight in private and public sectors.

The practical interest of the author today is to integrate the competence foresight processes of private and public sectors into the foresight processes of educational institutions. It is important to study how the foresight information from the labor market guide the processes of curricula planning and how it is possible to get the information to guide the competence foresight processes of the educational institutions' TM. These issues of course require successful competence foresight in the private and public organizations.

The research on HRD and TM does not deal with competence foresight. It appears to be a paradox that we still develop HRD practices and research without upgrading the information processes, which guide them. This paper addresses this deficiency and brings new valuable perspectives and practices for the researchers and practitioners. At its best, competence foresight practice integrates into the research and literature of the issue.

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