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# Competency Development in Knowledge Management and eLearning: Supporting Informal Workplace Learning

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**Abstract.** We show how competence spaces that establish a strong link between competencies and the tasks in which they are applied may be used for supporting competency development in Knowledge Management and eLearning. Two scenarios illustrate the integration of competence spaces into a workplace learning environment, which supports self directed learning from a knowledge repository and enhances feedback mechanisms in a coaching process.

## 1. Introduction

In recent times, methods derived from competency-based human resource management (also termed “competency management” or “skills management”) have been suggested to improve both knowledge management (KM) and eLearning interventions. Within these methods, competencies of individual employees (knowledge, skills, abilities) are being described and rated in order to improve accessibility of these assets or to develop them further.

In KM, competencies have been used to create yellow pages or expert searches within organizations ([1] and [2]) in order to leverage “tacit knowledge”. Others have suggested that competencies be defined as a means to derive goals for strategic knowledge development [3].

In eLearning, comparing profiles of needed competencies for different jobs to profiles of available competencies of individual employees has been utilized in an attempt to assign eLearning courses to employees who need them [4]. As a consequence, there are several commercial eLearning Systems that employ a skills management component.

Some authors see competencies as a way to closer relate KM and eLearning activities in companies (e.g. [5]).

In this paper we argue that KM and eLearning initiatives that aim to develop the competencies of the workforce and which employ competency management methods may be improved in two ways: (1) By providing a closer connection between competencies on the one hand and tasks or performance outcomes on the other, and (2) by seeing competency development as an individually controlled learning process rather than a centrally managed development initiative.

These two principles of our approach will be illustrated with results of a case study in a research institute of 30 members, in the following referred to as *Research Ltd.* Rather than employing competency development within a formal and centrally controlled development approach, we will show how it is better suited for an informal workplace learning framework. Two scenarios illustrate possible applications.

Seen in this light, any eLearning activity would have to emphasize self directed learning from a knowledge repository rather than the utilization of static courseware and feedback mechanisms in a coaching process.

## 2. Competency Development and Task Performance

In this paper, we define competencies as personal characteristics (knowledge, skills, abilities) of employees which are relatively stable across different situations (see also [6]). Competencies can be described in terms of distinguishable elements of underlying capacities or potentials which allow job incumbents to act competently in certain situations [7]. Employees dynamically combine these elements according to the requirements of the situation in a self-organising process [8].

Traditionally, competency-based training was targeted at specific behaviors that would constitute superior performance. Recently it has been argued that competencies are more than a set of behaviors, but rather a set of attributes that allow for superior performance and that development should be targeted at the underlying competencies rather than at the behavioral level. In accordance with this view, competency development then aims to extend the capacity of a person to act competently in a multitude of situations by helping this person acquire additional competencies which are applicable for performance in several tasks.

Our view of competency development is such that people acquire new competencies in interaction with real job situations and tasks (see also [7]). New competencies are being developed when a person enters a new situation in which action is not predetermined, or is confronted with new task requirements. Reflecting on the process or the outcomes or receiving feedback from a more experienced person helps in this development. This view is in accordance with a large body of research showing the importance of informal learning as opposed to formal training when it comes to learning at the workplace [9].

Any model for describing competencies should therefore aim to offer a tight integration between competencies and task performance. Using Korossy's competence-performance conception [10], we have developed a framework that achieves this integration. By relating competency descriptions to descriptions of task in which the competencies are being used (*task competency matrix*), we derive a structure on the set of competencies and on the set of tasks (*competence space*).

Table 1 gives an extract from a *task competency matrix* for *Research Ltd.* In this case, the competencies (A-G in the table) were typical competencies used in projects that deal with communicating to others. The tasks (the numbers in the figure) were several documents which had been produced in the projects employees had been working in, for example a project requirements document or a management summary. Each document represents a specific task that encompasses all actions necessary for producing the document.

Competencies	Project Documents										
	10	11	12	13	14	17	24	26	33	41	45
A Communication about client requirements		x	x	x		x	x	x		x	x
B Discussing ideas and concepts on an informal level			x			x	x	x		x	x
C Understanding goals of others	x	x				x				x	x
D Discussing a common practice in a team		x	x	x	x	x		x		x	x
E Employing effective interview techniques						x					x
F Presenting and selling own ideas			x			x	x		x	x	x
G Defining goals and persuading others		x	x		x	x			x	x	x

Table 1: Extract from a task-competency matrix for *Research Ltd.*

Figure 1 shows the *competence space* that can be derived from the matrix. The boxes in the figure represent *competence states*, which are characterized by a specific combination of competencies (A-G). States are connected by lines denoting a subset relation. Below the competencies, numbers of documents are given that can be created in the state (documents are only listed in the minimal state). For example, in the state {A, D, G} the documents 12, 13 and 14 can be created. The paths upward through the graph correspond to different development paths that employees could be taking in developing project management expertise. The method for deriving a competence space is described in [6].

### 3. Supporting Informal Workplace Learning

Competence spaces as described in the previous chapter can be the basis for a more effective support of KM and eLearning interventions. As competency development is inherently an individual learning activity, we suggest two ways for enhancing informal workplace learning.

#### 3.1. Scenario A: Feedback mechanisms for enhancing supervisor-employee learning interaction

At *Research Ltd.*, project managers are required to write a management summary at the end of each project (as part of a defined project-close-out process). In this management summary the project's goals, the approach taken, the results achieved and the value generated are stated within a few pages. However, many project

managers have difficulties taking a step back from the small project problems and technical details to give a clear, abstract description of what was achieved. But since the management summary is an important document which is published on *Research Ltd.*'s website and serves as a communication device to the management, its quality is of high importance. Thus, steps have to be taken to ensure the quality of the documents and to improve the capability of the project managers.

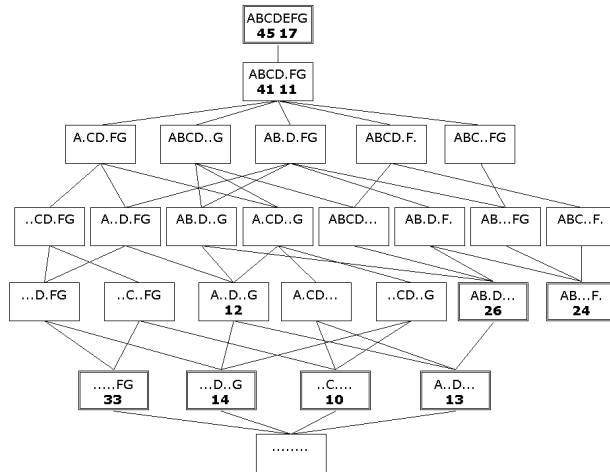


Figure 1: A Competence Space for Competencies A-G (see [6])

Imagine now that one project manager recently has completed a project. Using an environment which guides him through the project-close-out process (see [11]), he finishes writing his management summary. The document completion initiates a workflow in which the supervisor has to review the document and can provide feedback about its suitability (task rating). The management summary is part of a *competence space* (see Figure 1) and the project manager has previously created other Management Summaries. Based on this information the environment determines the likely competence state the employee is in and identifies competencies the employee is likely lacking.

In this case the environment finds out that the project manager in the past had low ratings in the competencies “problem abstraction” and “structured writing” and which are essential for writing a management summary. The environment displays these findings to the supervisor. He then reviews the management summary and rates these competencies again. The supervisor is thus supported in the task of diagnosing strengths and weaknesses of the project manager and will be able to offer detailed support as a learning coach. In this case the project manager has made considerable improvements in “problem abstraction” but still has some deficiencies in “structured writing”. Since the development of this competency is best done by providing detailed feedback and discussing the paper together the supervisor meets with the project manager and coaches him.

This scenario illustrates the connection between the competencies “problem abstraction” and “structured writing” and the task of management summary writing.

With a competence space that models the integration of competencies and tasks, it becomes possible to integrate learning in the working process. From the quality of the management summary, the system would suggest that the project manager should focus on the development of these specific competencies. Since these competencies are also crucial for other tasks (e.g. writing of user requirement definition) working to improve them will help to improve overall performance.

The roles of the two actors (project manager as learner and supervisor as coach) in this scenario underline the trend to perform competency development within the business unit as opposed to relying on centrally controlled human resource activities.

### **3.2. Scenario B: Providing access to a document repository for self organized learning**

Changes within *Research Ltd.* require each project manager to perform risk management in his or her project. Since our project manager has never assessed the risk of a project he is unsure about how this could be done, how often one should monitor the risks, and how to document the risks and their development over time. Again using the AD-HOC environment ([11]) – this time for the topic of risk management – can help to find relevant information.

Using the competence space and the information about the project manager's competency state now enables the environment to offer him resources especially applicable for him. Our project manager has previously managed projects in the field of business process modeling and thus has substantial competency in the creation and understanding of process maps. Based on this information the environment now offers him a concise risk-process map, a checklist and some example visualizations of risk portfolios. Long, verbose descriptions of the risk process are offered also, but much lower down in the list. In addition he finds pointers to other project managers within *Research Ltd.* who have some experiences with risk management.

This scenario shows that the knowledge about which competencies are available can be applied to other tasks. It also improves the self organized learning by offering documents and information applicable to the user in question. In this case, the environment can take on the role of the "coach" in the sense that for the initial building of the competency "risk management" available definition documents and examples are provided. Initially, no human coach is needed but can later be accessed through the environment as well.

## **4. Conclusion**

We have shown how competence spaces that establish a connection between tasks and competencies can support informal workplace learning. Two scenarios were meant to illustrate possible areas of application. Both utilize a structure of competencies that models the learning prerequisites within the set of competencies and the relationships to the tasks in which they are applied. This provides support in

competency assessment and coaching and enhances access to resources in a document repository for learning purposes.

One advantage of using competence spaces when modeling competencies is that they offer substantial potential for automating the process of competency profiling. Because competence spaces integrate competencies with the usual tasks performed in an organization, profiling can be done within the usual work processes. Additionally, the prerequisites in the structures reduce the amount of information that has to be provided manually. If the AD HOC environment utilizes a document management system, a workflow may be introduced in which only little information has to be provided to place a certain document into the underlying competence space, in order to make it accessible for learning purposes.

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