

3. Theoretical Background of Competency-based Recruitment and Selection¹

In this chapter we discuss the concepts and models that will come up hereinafter and the advantages and challenges of their application in the field of competency based recruitment and selection.

First and foremost we will sum up the major concepts that will be mentioned in the chapter. The connections between these concepts will be described too. The work of Binning and Barrett will be discussed next, in order to get to know the origin of nowadays' recruitment and selection theory foundations. That is followed by the key components of competency-based recruitment and selection itself: the process and its effects will be explained. The chapter after will examine competency management: we will look at the features of competencies, competency management and job-role design. At the end of the chapter the term of ontology will be introduced and also the means it can contribute to the work with competencies. In this context we show our Educational Ontology which will play an important role during the lifetime of the OntoHR project and also in the following chapters.

3.1 Concepts in brief

In order to see the concepts and the context clearly we would like to settle and clarify some definitions at the beginning.

¹ This paper is the third chapter of Gábor Dargai's BSc Thesis Work (Corvinus University of Budapest), which deals with the topic of ontology-based competency modelling, specifically with the development of an ontology model for the Information Systems Analyst job role. The work is carried out within the frame of the OntoHR project.



The most important concept that will appear continuously in this Thesis is competency. *“Competency is a temporally stable, narrowly defined, and trainable latent ability to complete an organizationally valued prospective job task successfully.”* (Mol, to be published)

In order to benefit from competencies, competency models should be built up for a job-role or an entire organization. A competency model refers to a group of competencies required in a particular job (OntoHR project 2010a)

If the competency-model is complete the next step is job design. *“Job design refers to the way tasks are combined to form complete jobs.”* (Robbins & Stuart-Kotze 1987)

Competencies and the relationship between competencies can be described with the help of ontologies. According to their definition *“Ontologies aim to capture consensual knowledge in a generic and formal way, so that they may be reused and shared across applications (software) and by groups of people. Ontologies are usually built cooperatively by a group of people in different locations.”* (Corcho et al. 2003, p.44), they also provide further practical possibilities for researchers.

The most relevant appliance fields of the competency-ontologies are recruitment and selection. *“The aim of recruitment: exploration and identification of as many potential candidates as possible, attraction of their attention to the job prospects at the company.”* *“When HR experts managed to recruit right applicants, the selection of the most qualified ones and of those who fit the organization and the job the best, can start.”* (Bokor et al. 2009, pp.142-143)

3.2 Binning and Barrett – The roots



First of all we would like to introduce the theory of Binning and Barrett who put down the foundation of today's recruitment and selection. According to them there are three approaches to establish the validity of predictor measures: the content-related approach, the criterion-related approach, and the construct-related approach (Binning & Barrett 1989):

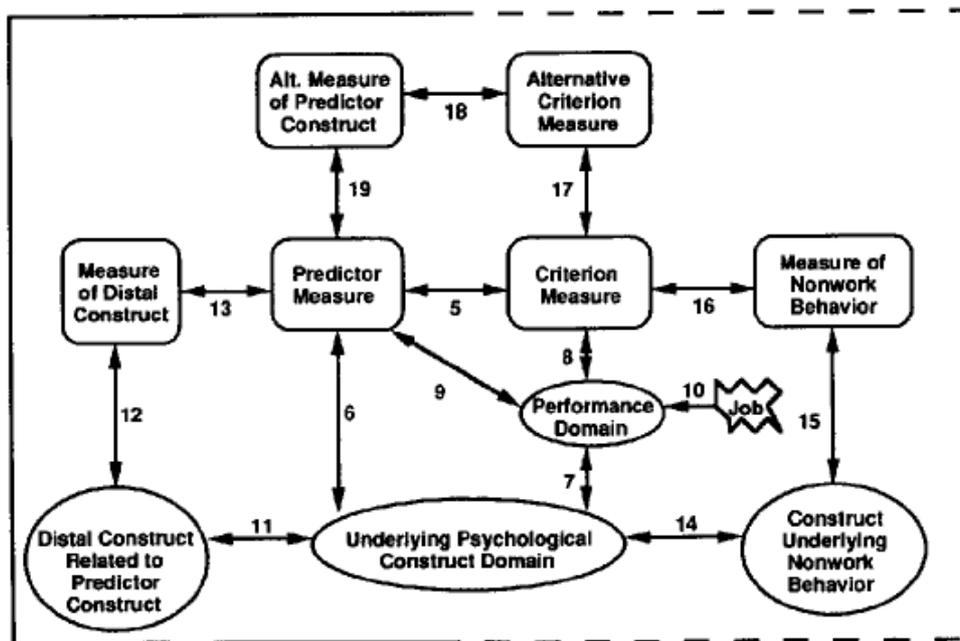


Figure 1 Model for personnel decision research (Binning & Barrett 1989, p.489)

The main objective is to find the connection between the Predictor Measure and the Performance Domain (Figure 1). The simplest way is inference 9, which links directly the two points. In this case only the Predictor measure is used to establish validity. This is the content-related approach. The criterion-related approach takes inference 5 and 8. There the sampling of the Performance Domain, the Criterion Measure (inference 8) is compared to the Predictor Measure (inference 5). The last possibility is the construct-related approach, which is a more theoretical one. It connects the two points applying inference 6 and 7. The

Underlying Psychological Construct Domain should be created according to the Performance Domain (inference 7). The Predictor Measure will rest on this domain (inference 6).

These inferences are advisable to think through and utilize when designing ontology- and competency-based recruitment and selection methods.

3.3 Competency-based recruitment and selection

Recruitment and selection is used for predicting the potential job performance of the applicants. With the help of this method organizations can find the best people to achieve their objectives. The difference between traditional and competency-based recruitment and selection is that the second one concentrates more on formal, measurable competencies.

The following illustration (Figure 2) demonstrates the process of competency-based recruitment and selection (Dubois & Rothwell 2004). However the figure speaks for itself, it is important to mention that from the first to the fourth steps the recruitment process is defined and the ones after show how the selection works.



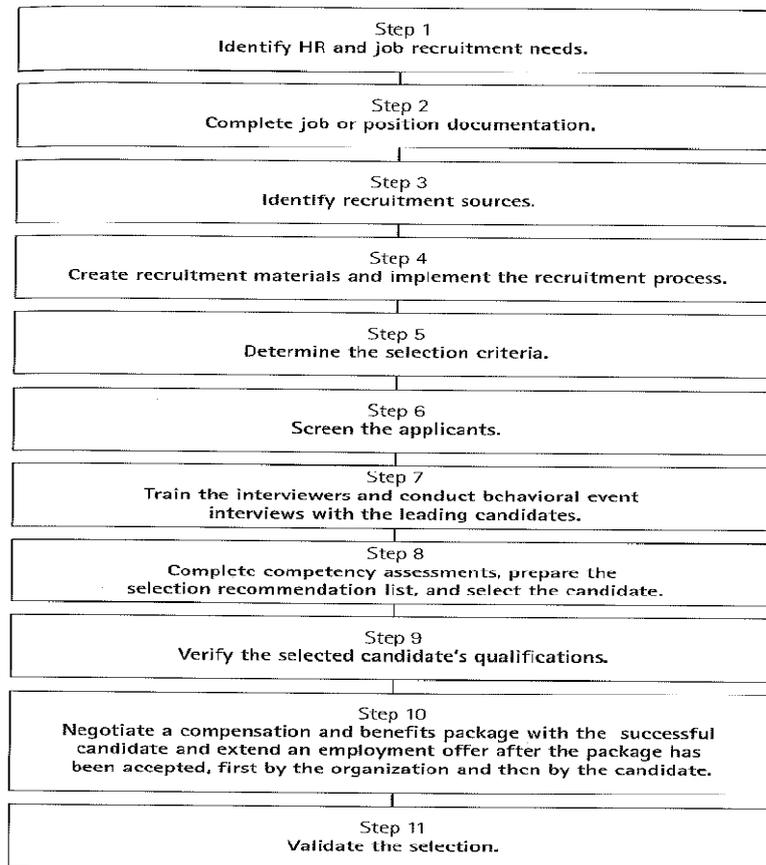


Figure 2 Competency-based recruitment and selection (Dubois & Rothwell 2004, p.113)

This method results in numerous advantages, for example:

- It is result-oriented.
- Discrimination is out of the question.
- Identifying backups for positions is easier.
- Traditional training times are less; employees' performance-levels are higher.



However competency-based recruitment and selection has several benefits, there are some challenges too:

- A disciplined approach to job and work analyses is necessary so the preparation for the recruitment and selection processes needs more time.
- Inefficient when recruiting unskilled or semiskilled workers.

So if the conditions are suitable this can be a highly effective technique to develop an organization's human capital.

3.4 Competency management

In order to carry out competency-based recruitment and selection for a position a competency model is essential to evaluate applicants. But obviously this is not the only field that can benefit from the concept of competency. Competency management can make things easier for organizations by facilitating the design of job-roles and its' competencies according to the organizational objectives.

3.4.1 Competency

Competencies have come up as a conception for naming and managing abilities, knowledge and skills and applying them on many different areas. Once the competency based approach is applied candidates' performance can be anticipated more easily and more exactly. It provides a more precise approximation of future performance than the testing of knowledge since it also explains how the knowledge is applied.



Besides knowledge there are other terms, like job performance or personality that are similar to competency but must not be mixed up with it. The difference between job performance and competency is that job performance describes an actual work behavior, while competency refers to the propensity of it. Personality also differs in a lot of ways from competency: personality is more stable but not as specific as competencies and it is not so significant within the educational and organizational context. It is also a crucial matter that competencies have a value “component” according to how much they worth for the company. Furthermore, contrary to personality, competency is related with knowledge (OntoHR project 2010b).

In order to get a deeper understanding of competencies, the classification of them and their components will be depicted now.

Different competencies are classified as hard competencies and soft competencies. Hard competencies are based on educational background and knowledge. Soft competencies can be derived from the personality of an individual, but they are still rooted in knowledge.

Besides these, competencies can be divided into another four categories (ExploreHR.org 2007):

- Employee Core Competency: related to the values, mission and strategy of the organization
- Managerial Competency: related to skills for performing managerial work and process. Application of it relates to those situations when there is interaction with other people.

Managerial competency can be divided into two categories:

- Human Competency: ability to work with, understand, and motivate other people.



- Conceptual Competency: ability to reduce the complexity in a given situation
- Technical/Functional Competency: it covers specific knowledge, techniques of a narrow field.
- Personal Attribute: competencies related to inherent personal characteristics that potentially affect work attitude and performance.

Since competency is a complex concept, it consists of different components. The followings are its' four elements (ExploreHR.org 2007):

- Skill: practical experiences developed during training.

As well as competencies skills also can be classified as hard and soft ones. While technical knowledge belongs to hard skills, the abilities that depend on our personalities are considered as soft skills. Soft skills include both interaction skills and motivation skills.

- Knowledge: the product of learning. Knowledge is simply and solely the information that is necessary to know in order to perform a job.
- Personal attributes: inherent characteristics, essential for developing knowledge and skills.
- Behavior: the observable manifestation of utilizing knowledge, skills, competencies and personal characteristics.



3.4.2 Competency modeling

The concept of competency allows us to collect competencies and then develop competency models for particular job roles and also for the whole organization. The organization's and the job roles' competency models should be consistent. Moreover the job roles' competency model should be derived from the organization's one.

To be successful in developing a competency model it is important to examine some relevant circumstances (ExploreHR.org 2007):

- Context – Will the model refer to the total organization, an entire function, a specific role or a specific job?
- Level of orientation – Will future or current job requirements be in the focus?
- Level of complexity
- The model must be linked to strategy (it should be company-specific, flexible and future-oriented)

Once the model is elaborated, the company, the managers and also the employees can profit from it in several ways (ExploreHR.org 2007):

- The effectiveness of the trainings can be enhanced by connecting it to the success criteria. (for the company)
- Employees can move across business boundaries as there are common standards for career levels. (for the company and for employees)
- Performance criteria can be identified in order to improve the accuracy and ease of the hiring and selection process. (for managers)



- Performance standards are more objective. (for managers)
- Different tools and methods are available for employees for developing their skills. (for employees)

3.4.3 Job design

The life of organizations that employ numerous people possessing different competencies can be complicated as they have to pay attention to their employees' satisfaction too. With the aim of keeping employees motivated, the most suitable and satisfying tasks have to be found for them, that is why job design methodology is invented and applied. Luckily with the help of competency management this task is simpler and more comfortable.

According to (Bowen et al. 2001, p.15) the application of job design consists of five steps which are the followings:

1. Review the mandate or mission of the organization;
2. Look at how various functions/components/tasks are carried out to achieve the mission/mandate (task analysis, task identity, task significance);
3. Establish the qualities that will be needed to perform the various components or tasks, as defined
 - Skill analysis: find the characteristics and abilities that will be necessary to complete the tasks.
 - Skill variety: prospective workers should have most of the required skills and learn the ones they don't.



- Autonomy: the level of control an employee has over the tasks and assignments.

4. Identify and describe discrete assignments (job descriptions);
5. Match selected human resources to jobs or assignments.

3.5 Ontology

Competency modeling approaches can be way more effective if they are supported by ontology. Ontology is a semantic technology which is used for defining concepts of phenomena and the relationships between certain objects. Tom Gruber drafted the most widely known definition in the topic: „*An ontology is a specification of a conceptualization.*” (Gruber 1993, p.1)

One of the numerous benefits of using ontology is that in theory even the most complex systems can be described in a well structured way. Furthermore, this structured description is sharable and reusable, which is – for instance - useful for enriching AI (Artificial Intelligence) software.

Usually competency ontologies consist of competencies, competency types, competency levels and last but not least competency relationships.

If an organization decides on developing an ontology model, it will recognize that ontology-based competency-oriented modeling approaches have to deal with some challenges (Schmidt & Kunzmann 2007):

- A well-defined common understanding of each competency is required.
- Semantically coherent systems and services have to be constructed.

Therefore these efforts run into a problem, namely that more distinct and realistic models go with more complicated management and controlling tasks. For example, it is more complicated to prepare a job advertisement or to rate the candidates on the basis of a model which comprises a great deal of competencies as if we have only a few competencies.



But if this difficulty is handled the use of ontologies can be a very profitable solution.

3.5.1 Sustainable Competency-Oriented Human Resource Development with Ontology-Based Competency Catalogs

The work of the Professional Learning project of the FZI in Karlsruhe, Germany is a good example of ontology-based competency-oriented modeling approaches (Schmidt & Kunzmann 2007). An ontology based reference model for HRM was developed within the frame of the project. Their model supported HR development by connecting its' strategic and operational levels. Besides not only the continuous updating of the organizations' competency catalogue became possible but the competencies of individuals and the organization are also connectable with the help of the model. Furthermore competency models can be integrated into business processes since – thanks to the ontology - the model is sharable and reusable across different IT platforms.



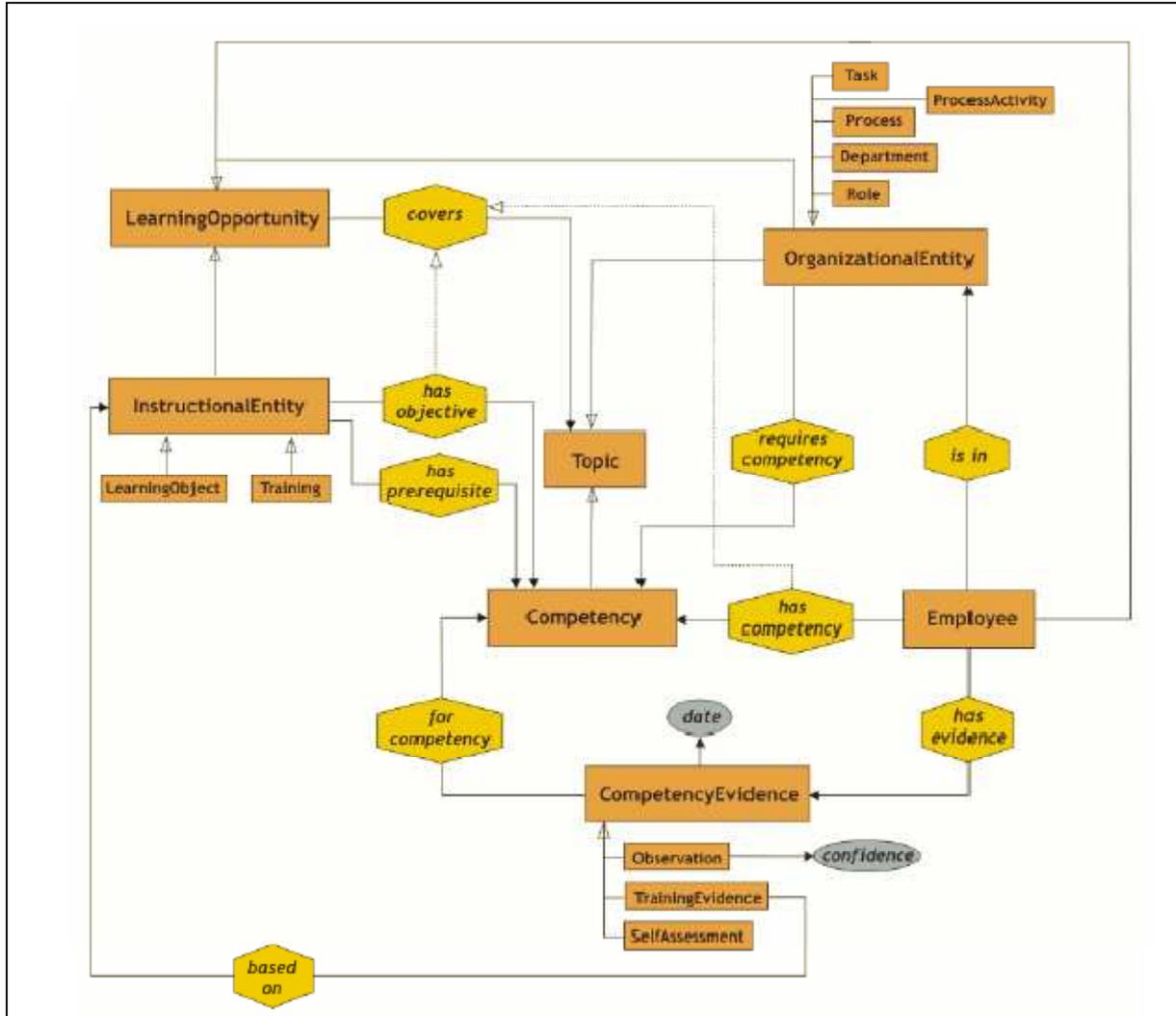


Figure 3 Professional Learning Ontology (Schmidt & Kunzmann 2007, p.3)

3.5.2 Educational Ontology

Vas Réka's Educational Ontology (Vas 2007) was developed for the Department of Information Systems at the Corvinus University of Budapest. The Educational Ontology is a general ontological model for describing different training programs. During the Ontohr project the model will be further developed and extended.



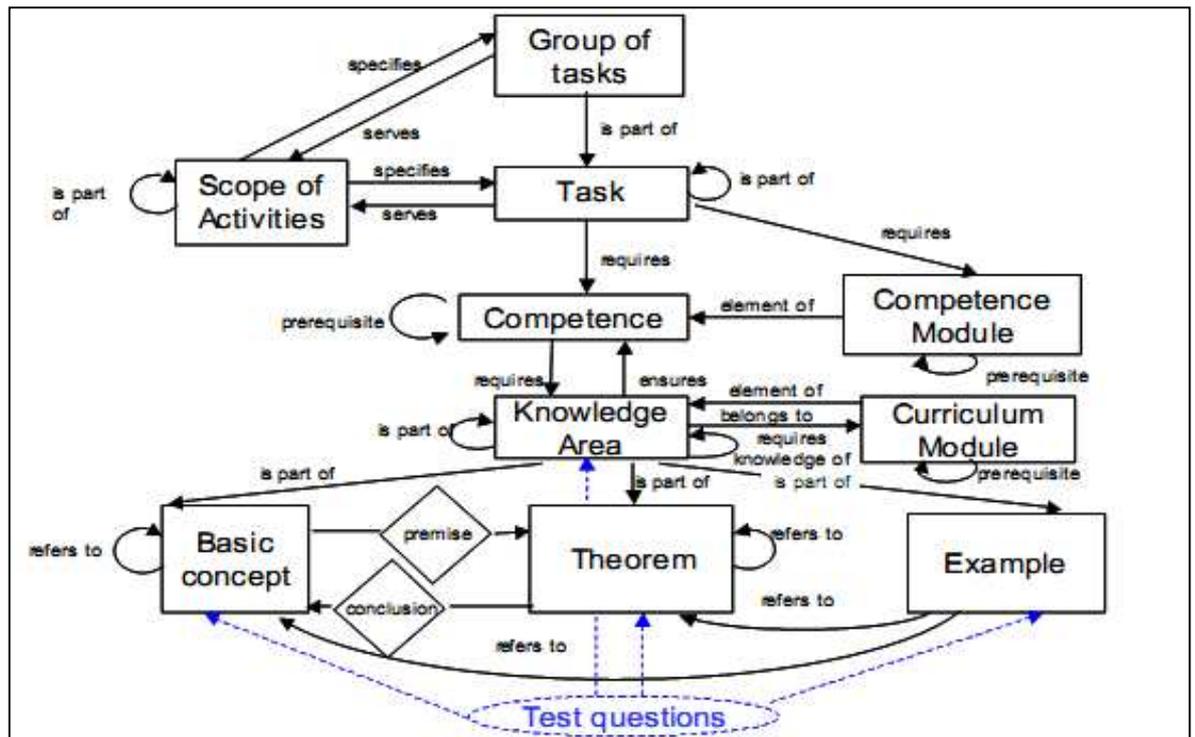


Figure 4 The Educational Ontology (Réka Vas 2007, p.128)

As it is visible on Figure 4 the top half of the model describes the concepts that belong to the job. On the other hand the bottom half pertains to the training. The connection between the two parts is provided by the „competence” class, considering that competencies should be picked up through education and then utilized at the workplace.

The “Scope of Activities” class involves the activities that can be performed after finishing a given training program. Its elements are “specified by” or “served by” the “Tasks”. In order to be able to carry out the tasks defined by the “Task” class the relevant competencies have to be acquired. The “Group of Tasks” and the “Competence Module” classes define the sets of tasks and competences. The “Competency” class is in “require” relation with the “Knowledge Area” that belongs to a certain “Curriculum Module”. The “Basic Concept”, “Theorem” and “Example” classes are parts of the “Knowledge area”, which



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can be part of other “Knowledge Areas” too. With the help of the “Test Questions” the “Knowledge Areas” and the Sub-Knowledge-Areas can be assessed.

Nowadays ontology is gaining ground in computer science. It facilitates the improvement of understanding between persons, organizations and even softwares. Taking advantage of it in the field of competence management can be a huge boost for HR solutions. OntoHR project attempts to utilize this possibility and uses ontology as the basis of its research.



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