CHAPTER-3

SOFT COMPETENCY MANAGEMENT
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The development of key competencies (soft skills) demanded by employers can increase opportunities of students, the unemployed and employees to succeed on the labour market. Key competencies, however, do not play an important role in the school curricula and in the training programmes for adults. The existing education system is focused mainly on the development of general and profession related knowledge and, sometimes, of professional skills.

Based on the analysis of more than 30 interviews with employers – small, medium and large-sized companies - the Competence Model was identified which includes the following 14 key competencies:

C1 - Competency for effective communication
C2 - Competency for co-operation
C3 - Competency for entrepreneurship
C4 - Competency for flexibility
C5 - Competency for customer orientation
C6 - Competency for efficiency
C7 - Competency for independence and decisiveness
C8 - Competency for solving problems
C9 - Competency for organizing and planning
C10 - Competency for life-long learning
C11 - Competency for proactive approach
C12 - Competency for stress resiliency
C13 - Competency for exploring and orientation in information
C14 - Competency for communication in foreign languages
The companies agreed that the development of the above-mentioned competencies is one of the key strategic priorities. With this strategy the e-recruitment system has been introduced by some of the companies.

**E-RECRUITMENT**

The web has drastically changed the online availability of data and the amount of electronically exchanged information. It has revolutionized access to personal information and knowledge management in large organizations. Currently, e-recruitment is one of the typical applications of such a knowledge management approach through the web. The traditional recruitment methods of advertising vacancies in newspapers, magazines and trade press, as well as advertising at job fairs, employing recruitment agencies and registering with search firms were adequate in the past. Access to the Internet has proven that these methods are too slow, expensive and lacking in their ability to deliver high-quality candidates in the shortest possible time in the modern employment market. The global e-recruitment market is currently booming. Faced with this explosion of e-recruitment, many candidates deposit, each day, their Curriculum Vitae (CV) in what is now commonly called a CV Bank (the greatest websites announce until more than 50,000 CVs recorded in their bases).

In addition to a broader diffusion, this approach offers to a job seeker both reactivity and facility when updating its personal information. On their side, in addition of having a plentiful fishpond of candidates, the recruiters benefit the same aspects: massive diffusion of their job offers, rapidity when contacting candidates, reactivity, etc. Moreover, for certain a company, publishing on line their job offers is a sign of good economic health; in that way, e-recruitment becomes a vector of institutional publicity. Paradoxically, this revolution of the job market based on the use of information technologies is not accompanied by an evolution of the tools dedicated to the retrieving and the management of CVs and job offers. Indeed, the techniques used to analyze the information resources related to e-recruitment remain very rudimentary. For instance, the search engine provided by Monster (http://www.monster.com) is simply based on
combinations of locations, list of keywords and sectors (for instance, Human Resources or Information Technology). This approach, which seems too poor for being really effective from a qualitative viewpoint, is prejudicial both for recruiters and for job seekers. The formers have difficulties to choose the best person for their needs (recruiters are under a rain of CVs and information whereas they are thirsty for competencies). The latter have difficulties to emphasize their competencies through the writing of their CVs (and thus to break free from competition) and have difficulties to find job offers which ideally correspond to their profiles.

COMMON CV

COMMON CV is a project which aims at proposing new job-matching services. The principle underlying COMMON CV consists of considering a CV (a job offer) as a synthetic view (expressed in natural language in terms of qualifications, work experiences and extracurricular activities) of a richer network of competencies. According to this principle,

- The first objective of the project COMMONCV is to allow the end-user (i.e. a job seeker (or a recruiter) to make explicit all the competencies underlying its resources (i.e. its CV or its job offer).

- The second objective is to formally represent these competencies in order to provide more powerful e-recruitment services: the content (expressed in terms of competencies) of CVs and job offers must be manageable by computers. These objectives require

  1. The definition of a competency model and

  2. The definition of a process dedicated to the management (i.e. identification, formal representation and exploitation) of the competencies underlying a CV or a job offer.

The competency model we propose is based on the following definition: a competency corresponds to a set of resources (i.e. knowledge and/or behaviors and/or more basic competencies) which is mobilized in a
particular context for reaching an objective or fulfilling a mission. The competency management process we advocate is based on the use of techniques currently developed in the context of the semantic web area.

It is important to notice that the competency logic is not a new approach in the human resources area; this logic is now practiced in most of organizations for different purposes such as staff development and deployment, job analysis, learning organization or economic evaluation. However, in the context of e-recruitment, this logic is not yet applied. The advent of the semantic web must be considered as an opportunity to develop this competency logic for e-recruitment; the project COMMON CV must be considered as a first attempt to this purpose. The goal is to transform the current websites into real Career Networks, i.e. virtual places where both job seekers and employers can find relevant and efficient services to meet their respective needs.

The competency model underlying COMMONCV

The definition of the term competency differs according to the considered discipline (sociology, organization management, psychology, etc.). In this part, we first briefly introduce the definitions of the concepts which are generally used to characterize a competency and then, we present the model we advocate for annotating the information sources manipulated in e-recruitment: the CV and the job offer.

Definitions

The concept of competency is generally associated to others concepts such as knowledge, skill, ability, know-how, experiment, aptitude, capacity, personality feature, behavior, etc. However, the analysis of the literature allows making explicit three fundamental characteristics of this concept the resources, the context and the objective.
The resources of a competency

A competency is made of resources structured into categories and sub-categories. To comply with the literature, three fundamental categories of resources are considered:

1. **Knowledge.** It is something which we acquire and store intellectually. It concerns everything that can be learned in the education system, or everything that requires preliminary magisterial teaching. This category comprises theoretical knowledge, knowledge on existing things, and to know the mounting procedure of an electronic card for a type.

2. **Know-how.** It is related to personal experience and working conditions. It is acquired by doing, by practice (for instance, to have experience on managing certain types of contracts). Synonyms are skills, operational capacities and experiments. This category includes formalized know-how (e.g. the application of working procedures) and empirical know-how. This latter category consists of operational know-how which is hard to structure and to formalize. These know-how are generally individual-dependent; they correspond to tricks, intuitions, tacit know-how, ability, talent, etc. Both knowledge and know-how are equally important. As they grow together so grows the competency of the individual.

3. **Behaviors.** These are individual characters (or characteristics) which lead someone to act or react in a certain way under certain circumstances. They often condition the way knowledge and know-how is put in practice. This category includes human traits, qualities and attitudes; examples are initiative, tenacity, creativity, self-confidence, communication, curiosity, etc. Note that in some works, according to the resources which are mobilized, two types of competencies are distinguished:

   • **Hard Competencies** identify the basic (and generally technical) resources which are required to perform an activity. These resources are generally expressed in terms of Knowledge, Skills and Abilities (KSA).
• Soft Competencies correspond to personal behaviors, personal traits and motives. Examples of soft competencies are leadership (ability to guide, motivate and influence personnel to meet the organization goals), working with others, having a safety conscious focus, integrity, persuasiveness, adaptability (ability to readily adapt to new conditions, teams or tasks and to be receptive to new ideas or opinions), etc.

Hard competencies (KSA) are focused on technical aspects whereas soft competencies allow making the difference for a given level of KSA. With the image of the iceberg, one puts the soft competencies under the water line, like driving forces of an observable behavior.

The context of a competency

Competency always comes out with reference to a given context. The competency context is related to the environment in which the competency is situated. It represents the conditions and the constraints in which competencies should be mobilized. It includes physical or immaterial aspects of the system to be studied. The competency context can be restricted to a station or to a system and its external environment. Competency can react on its context aspects or use them to be mobilized, e.g. to use tools to repair a machine. Indeed, its context influences its required resources for carrying out a mission, e.g. the repair of a critical machine in the flow of production differs from the repair of a multiple machine.

The objective of a competency

Competency is related to the accomplishment of one or more missions or tasks or to reach a goal. These goals, missions or tasks constitute the objective of the competency. Currently, the definition of the competency concept seems to get stabilized and to converge towards the following definition:

*Competency is the effect of combining and bringing into play its resources (i.e. knowledge, know-how, and behaviors) in a given context to achieve an objective or fulfill a specified mission.*
Finally, when performing a competency, a cognitive process is applied in order to select the resources, to manage their combination layer by layer, and to control the way of bringing them into play (i.e. enacting or putting them into action).

**The competency model**

In our work, a competency is considered as a set of resources (knowledge, behaviors and/or basic competencies) which are mobilized to reach an objective or to carry out a mission in a particular context. The cognitive process of bringing-into-play a competency is not considered in this definition. Besides, the know-how is considered as a competency which has little or no resources clearly identified. Finally, it is important to underline that our model only focuses on *individual competencies*; it does not deal with *collective competencies* which is problem out of the scope of COMMON CV. In this context, the definition of a competency is based on the following quintuplet: where $C_i = (K,B,C,A,o)$

- $K$ is a set of knowledge which is necessary for $C_i$. An element of this set $K_i$ can be theoretical or procedural.
- $B$ is a set of behaviors which are necessary for $C_i$.
- $C$ is a set of basic competencies which are necessary for $C_i$. An element of $C_i$ this set corresponds to a know-how (formalized or empirical) which, in our work, is considered as a complete competency.
- $A$ is a set of aspects which define the context of $C_i$. Several types of aspects can be considered: social and organizational aspects, economical aspects, physical aspects which include machines and technologies, informational aspects, etc.
- $o$ is an objective (it is not a set of objectives). This objective can correspond to a mission to carry out or to a task to achieve.

This quintuplet specifies that a competency is defined by a set of sets of resources ( $K,B$ and $C$ ) which is mobilized in a particular context for reaching an objective $o$. 
When a competency is elementary (for instance, a know-how), the sets K, B and C can be empty. When the competency corresponds to an empirical know-how, the sets K, B and C can be indefinite. Finally, when the competency is universal, the set can be empty.

This quintuplet can be used for representing both a required competency and a competency acquired (or provided) by individual people involved or being able to be involved in a system. Indeed, a required competency \( C_i \) is required by a system possessing the objective of \( C_i \) and the aspects of the context of \( C_i \). An acquired competency \( C_i \) is acquired by a person who has already mobilized the resources of \( C_i \) in its individual context and for its objectives. One can consider an alternate category of acquired competencies that can be called (potential competencies). A potential competency \( C_i \) is supposed to be possessed by a person when this latter has the potential to mobilize the resources of \( C_i \) in its individual context and for its objectives.

**Principles of the competency management process**

The process we advocate is based on the techniques currently developed in the semantic web area. These techniques are concerned with (1) the construction and the sharing of domain ontologies (*ontology is a formal, explicit specification of a shared conceptualization.*) and (2) the formal representation of the content of web information sources (in our context, CVs and job offers), by using specific languages such as ontologies and to the annotation of web sources). In this section, we first justify why the semantic web and the ontologies are crucial when dealing with e-recruitment from a competency management viewpoint. Then, we present a scenario of use underlying COMMON CV in order to give an intuitive understanding of the benefits provided by our approach of, e-recruitment based on competency management.

**The semantic web and the ontologies**

The goal of the semantic web is to be a web talking to machines, i.e a web that’s the content can be processed by computers. It can be thought of as an
infrastructure for supplying the web with formalized knowledge in addition to its actual informal content. It will benefit citizens because it will support them in their day-to-day work, leisure and interaction with organization and because it will help them to enforce the degree of control they want (over their personal data, preferences, etc.). Like the web, the semantic web is not an application; it is an infrastructure on which many different applications (like e-commerce or e-recruitment) will develop.

Ontologies are central to the semantic web because they allow applications to agree on the terms that they use when communicating. They are a key factor for enabling interoperability in the semantic web. The Knowledge Engineering literature contains many definitions of the term ontology. A definition, which seems to be a consensus and which is based on a first proposal can be expressed as follows: **ontology is a formal, explicit specification of a shared conceptualization.** A **conceptualization** refers to an abstract model of some phenomenon in the world which identifies the relevant concepts of that phenomenon. **Explicit** means that the type of concepts used and the constraints on their use are explicitly defined. **Formal** refers to the fact that the ontology should be machine-readable. **Shared** reflects the notion that an ontology captures consensual knowledge (it is not restricted to some individual, but accepted by a group); this consensus is concerned with both the domain structure and the terms used to describe the domain.

In the context of COMMON CV, the ontologies are crucial because they allow a recruiter and a job seeker

(i) to have a common understanding of the competencies and the tasks underlying a profession and

(ii) To share the same vocabulary for denoting these notions. Moreover, ontology can be used by a job seeker as a reference system for identifying its personal competencies.

Indeed, when writing a CV, it is usually difficult to choose the best sentence (in natural language) for expressing the competencies acquired during a
professional history. Sometimes, the adopted sentences are not very significant and do not include or precisely reflect all the competencies of a person. Therefore, having a reference of the tasks and competencies underlying a profession can be an effective help when dealing with the identification of individual competencies. Such a reference can also be used by a job seeker to evaluate whenever its competencies are compatible with the ones required for a profession; if it is not the case, he can plan a formation in order to acquire the missing competencies.

COMMONCV: a scenario of use

All the ideas advocated in the COMMONCV will be implemented and tested upon CVGEN. CVGEN is a website which allows a job seeker to record in a database its professional history and extracurricular activities and then to automatically generate a CV from these information. This website implements a particular methodology dedicated to the construction and the writing of a CV. This methodology focuses on the content of a CV; it also provides advices on the form. The website implements this methodology in the sense that it provides to a job seeker a series of web forms that he must fulfill for describing its qualifications, professional history and extracurricular activities. These forms, which clearly correspond to the structuration of the information that must be indicated when describing a professional experiment or a diploma, help the job seeker to make explicit all.

In order to facilitate this process, we advocate the use of domain ontologies. The domain ontologies include all the concepts that are necessary for representing the resources, the context and the objective of the competencies underlying a significant part of a CV; these concepts can be related to the tasks associated to a profession, know and know-how underlying a diploma or a task, the organizations of enterprises, cultural or economical aspects denoting the considered context, etc. For instance, the identification and the representation of a competency underlying a work experience can be based on different types of ontologies such as:
1. **Sector ontologies**: these ontologies are constructed by the actors of a specific sector and its associated professions, for instance, ontology dedicated to Finance/Banking or Healthcare. The actors of the considered sector (for instance a trade union, a ministry, a firm which is the leader of the sector, etc.) are responsible of the evolution of the ontology in terms of new professions, new tasks associated to a profession, new resources required for a task, new organizations of the firm related to the considered sector, etc.

2. **Enterprise ontologies**: these ontologies are constructed and updated by the enterprises of a sector. They can be specializations of sector ontologies in the sense that they may include (for a given profession) the description of addition tasks which are performed according to the specificities of the enterprise, technological, cultural or sociological aspects (which are not taking into account in the sector ontologies), etc.

3. **Behavior ontology**: this ontology is dedicated to the structuration of human traits, qualities and attitudes such as leadership, integrity, persuasiveness, adaptability and to representation of the rules which can exist between these notions. This ontology (which can be considered as generic and independent from a diploma or a profession) in collaboration with the psychologists of Performance. The exploitation of these ontologies for identifying the competencies underlying a work experience will be done as follows. First, the job seeker chooses a sector (from a hierarchy of sectors) and then the profession of the sector which better characterizes the considered work experience; this selection can be done by using prototypical references.

**Conclusions**

In this chapter, we have presented the overall ideas underlying the project COMMONCV (which is dedicated to the management of competencies in the context of e_recruitment) and we have proposed a competency model adapted to one of our objective: the formal representation of the competencies underlying a significant part of CV or a job offer. We have also justify why the semantic web and the ontologies are crucial for this project and we have introduced a first scenario of use in order to give an intuitive understanding
of the benefits provided in our approach. From a technical viewpoint, we plan to represent all the domain ontologies by using a semantic web language.

A statement can be clearly associated to the part of the CV where the considered competency is illustrated (for instance, a work experience or and extracurricular activity).

This ongoing work is currently in progress towards the definition of the scenario of use dedicated to the recruiter viewpoint and the definition of operators dedicated to the matching between the required competencies underlying a job offer and the acquired competencies underlying a CV. These operators will be based on the reasoning mechanisms provided by the semantic web languages.
References


