Portals for Integrated Competence Management

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INTRODUCTION

Human resource portals are often dedicated to *e-recruitment* (e.g., Monster, Jobpilot). Their main goal is to facilitate, accelerate, and widen the area of recruitment. Portal technology can also be used inside companies to directly update job offers and to publish them, to store skills of current employees, their careers and so on. These portals are based on *database technology* (usually relational) for storing, organizing, and searching relevant information.

While these solutions are effective to some extent, there are two major limitations. First, they are based on *raw data* (such as CVs and job offers), which are organized according to some informal "reference grid" (like a job or skill tree): indeed, limited attention is devoted to this data organization and to its foundations. Instead, data organization should be based on the central concept of *competence*: raw data are interesting if they convey information about what abilities are required for accomplishing tasks and what abilities individuals hold (or have acquired). This information is indeed the competence, required and acquired respectively. Second, these solutions are based on database technology that does not really support the systematic analysis, exploration, and sharing of raw data and therefore, offers limited support to what can be called *competence management processes*.

Competence management processes such as processes for assessing competencies of individuals cannot be supported by portals if the concept of competence is not correctly represented. For instance, it is difficult to implement portal services that try to automatically find out competencies of individuals from their CVs or, inside a company, from other documents (like activity or process reports, which individuals have made).

For these reasons, we have developed a competence management process reference model and a competence reference model. These two reference models allow us to precisely define what competence management should provide and therefore, which services and functionality should be implemented now and in the future in human resource portals. Furthermore, these reference models provide a starting point for actually implementing these services and functionalities.

This article is organized as follows. Human Resource Portals discusses existing portals for human resources. Reference Models for Competence Management is about the reference models of competence management. An Example Using Dynamic Taxonomies and Information Retrieval introduces an example that applies dynamic taxonomies to support some competence management processes, specifically the assessment processes. Finally, future trends are provided.

HUMAN RESOURCE PORTALS

A human resource portal is a Web-based tool to automate and support HR processes. It can be used inside companies to manage employee careers and employee and company competence evolution. It can be used from outside the company as a facilitator of e-recruitment and as a means to develop an e-recruitment market (including recruiting and interim companies). Currently, the e-recruitment market registers a major growth and human resource portals are booming. The reasons for the growing popularity are: (1) increased satisfaction of candidates and a dramatic reduction in the time and cost to recruit, (2) the growth of the Internet, which serves a large audience and is used for a wider spectrum of benefits, (3) efforts in R&D, with the goal of being the first provider and increasing one's market share. An example is an increasing effort on "matching technology" (i.e., the way to match CVs with job offers) by recruitment agencies and (4) finally, e-recruitment is a true cross-sector application, and even the public sector is rapidly catching up (http://www.alljobs4u.com).

Inside companies, a human resource portal manages the employee life cycle from start to termination. It follows service, job, and position changes as well as provides current

information on current position in the organization, reporting relationships, and work and home contact information. It supplies interview tips or salary surveys, as well as expert career advice, and so on.

E-recruitment portal services are mainly concerned with CVs management. They allow candidates to post/edit CVs and employers to manage selection and contacts with candidates. They send automated acknowledgments when CVs are received, carry out online searching, shortlist/reject CVs, contact selected/rejected candidates by e-mail, schedule interviews, archive/delete CVs, and generate management reports. For a company, e-recruitment portal services are a fundamental tool to communicate its recruitment policy, to present trades, functions, training, personnel testimonies, to control temporary staff costs, and to motivate its existing talent.

Being a warehouse of huge data and documents, several portals provide services to structure, organize, and mine interesting data. For instance, they can transform a posted CV to a formatted CV by extracting data and structuring them according to a given template (for instance name, sex, address, phone, birthplace and date, nationality, availability date, experiences, diploma, hobbies, etc.). Sometimes, they help seeking CVs using keywords.

However, these portals are not organized around the central concept of competence on which the "matching technology" previously mentioned should be based. Several portals attempt to manage competencies by introducing in the CV template fields such as pre-established lists or free text about skills, functional areas, areas of specialization, jobs, or trades. This, however, falls short of true competence management. After an extensive work on the state of the art competence concept, we have synthesized the following definition: a competency is the effect of combining and enabling operational use of its c-resources being c-resources some specific well-defined and simple abilities of individuals according to three conceptual categories—knowledge, know-how, and behaviors—in a given context to achieve an objective or fulfil a specified mission (Harzallah & Vernadat, 2002; Marreli, 1998; Lucia & Lepsinger, 1999). This is operational and can effectively be used to implement portal services and functionalities as explained in Section 3.

REFERENCE MODELS FOR COMPETENCE MANAGEMENT

Competence management can be organized according to four *kinds of process* (i.e., inside each process, several processes may run):

- **Competence Identification:** When and how to identify and to define *competencies required* (in the present or in the future) to carry out tasks, missions, strategies;

- **Competence Assessment:** (1) When and how to identify and to define *competencies acquired* by individuals and/or (2) when and how a company can decide that an individual has acquired specific competencies;
- **Competence Acquisition:** How a company can decide how to acquire some competencies in a planned way and when;
- **Competence Usage:** How to use the information or knowledge about the competencies produced and transformed by identification, assessment, and acquisition processes. For instance, how to identify gaps between required and acquired competencies, who should attend required training, how key employees (i.e., holding key competencies) can be identified, and so on.

Companies can use this *process reference model* for their competence management. Additionally, recruiting companies should eventually support (some of) these kinds of processes. In both cases, distributed process management plays a key role.

Based on the process reference model and the state of the art about the concept of competence, we introduce the *competence reference model* (*CRAI model*). Figure 1 depicts in (lower part, filled-in gray) the original CRAI model by using a simple entity-relationship like language (*rectangles* are *entities*, *diamonds* are *relationships,* and *rounds* are called *attributes*). CRAI provides a clear understanding of what is a competency and which are its constituents. It also allows us to distinguish between competencies and other complementary information (usually required by recruiters) about individuals such as age, availability, salary, location, and so on. In fact, such complementary information can be represented as attributes (i.e., properties) of the entity individual; in this way, the information does not participate in the definition of competencies, which is indeed based on the three other entities (i.e., C-resource, competency, and aspect). It should also be noted that individuals are not directly related to competencies; in fact, individuals are related to c-resources and each c-resource describes a specific simple well-defined ability. A competency is therefore defined as the set of c-resources related to that competency through the relationship <to associate>. Consequently, an individual holds a competency if he or she holds all the specific abilities (i.e., c-resources) related to that competency through the relationship <to associate>.

CRAI is used to build *enterprise specific competence models* by (1) specializing the entity aspect (taking the form of a *multifaceted taxonomy)* according to the constituents of the company (i.e., the artifacts of the *enterprise model* like machine, project, technology, order, programming language, and so on) and then by (2) instantiating the entity aspect and its specializations (e.g., "m1," "m2," etc., which are machine, called *instances* of the entity machine then classified as machine), <c-resource> (for instance, R1: "to know the

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