

## **A conceptual model for developing a personalized adaptive elearning system in a business environment.**

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In this paper we present and recommend a conceptual model for designing and developing an adaptive elearning system that main application is the identification of educational needs of employees from formal and semi-structured data and the choice of the appropriate personalized learning strategy. The human resource department has the responsibility for the all process. We use available international standards and explicit knowledge to develop a conceptual model of knowledge that is spread within the company. The model has the form of ontology and gives the opportunity for content based information research and retrieval of educational needs for a given educational program from the human resource department. The conceptual model exploits complex issues such knowledge acquisition, usage and preservation.

**Keywords** adaptive, elearning, ontology

### **1. Introduction**

Today companies with innovative and complex operations which operate in dynamic environment has faced with the challenge of continuous education of employees [1]. The presentation of employees in an educational institution don't recommended because costs in terms of time and assets and absence from the company. Elearning in the business environment is adult centered and business related and has advantages for the company and for its employees such as keeps the educational level of employees at the competitive level, allows to employees to complete tasks without the support of experts or external consultants and crucial for the employees who change their position and duties in the company [8]. The adaptive learning system must provide learning on demand from employees. The learning content and material must be up to date, meets the needs of enterprise and must be pedagogical designed taken in consideration the previous knowledge and skills for each employee.

The paper consists of three chapters. Chapter 2 introduces the appropriate adaptive learning method. Chapter 3 proposes the conceptual model for developing a personalized adaptive elearning system for the continuous education of employees. Chapter 4 concludes the paper.

### **2. Adaptive learning and personalized learning strategy**

Adaptive elearning in a business environment has three parts. First part is the identification of personal and business educational needs from formal data such CV and content of databases and informal data (reports, evaluations and management decisions) and the determination of the learning outcomes. The second part is the choice of the learning objects and material and the proposed learning strategy according to personal and business needs and the third part is the continuous control of personalized learning outcomes from the human resource department.

The following learning models are most effecting for employees, the Andragogy from Malcolm Knowles [2], the Self-Directed Learning and Critical Reflection from S. Brookfield [3] and the David Kolb: Experiential Learning Cycle from D. Kolb [4].

In the economy of knowledge the experimental Learning Cycle is the most appropriate for adults training [5] because has the opportunity to connect the new knowledge with previous experience, to support self directed learning. A significant impact is that adults acquire complex problem solving skills.

### 3. The conceptual model

The human resource (HR) department delivers from top management the corporate strategy, the business goals and objectives, identifies the tactic knowledge that is essential in order to achieve the above and generates the learning outcomes. The HR department with the cooperation of training department connects the business objectives with the learning outcomes, in such a way that the learning outcomes serve and support the business objectives. The HR department determines the gap between existing and desired knowledge and suggests the learning objects and material taken in consideration the educational level and skills for each employee and finally assess the training needs. The employees should be involved in the achievement of business objectives. A critical point in the overall process is that the gap between existing and desired knowledge need to be minimum as possible for cost and time reasons. In the case that the company employs a significant number of employees the manual identification of the appropriate trainees is time consuming and expensive.

The proposed approach is the semiautomatic annotation of skills from formal and semistructured data [6]. In a typical set-up, a knowledge engineer starts from a hand-crafted initial ontology, collects texts about the concepts described from company-internal document libraries and apply the ontology extraction tools to this textual material. The ontology consists of a set of concepts and relationships that describe the domain of skills and knowledge. This will bring to light the existence of conflicting perspectives on conceptual relations (ontology evaluation), allow population of the initial ontology with addition classes, instances and relations (ontology extension), and allow the tracking in time of changes to ontologies. The result is a human resource ontology by integrated international standards, vocabularies and classifications with explicit knowledge of the company.

Simultaneously the training department starts the learning design used educational modeling language (EML) specifications. The EML describes the structure and educational process based on andragogy techniques for adult learners. The IMS learning design proposed (IMS/LD) [7]. The result of the all process is the development of the learning objects and materials that are necessary for the achievement of business objectives. Finally the training department designs the learning outcomes and suggests them to the top management. The knowledge concept of learning design has the form of ontology.

The experimental life cycle starts to be applied. The learning sequence defined for each employee. Self learning techniques are easy to apply because the gap between existing education and learning outcomes has narrow difference [9]. The gap between educational level and learning outcomes examined with details. A set off algorithms and techniques are employed for ontology matching and computed the semantic distance between instances [10]. The personalized course designed through semantic querying and the learning material retrieved with content research from repositories. When the process has been completed the training department assesses the learning outcomes for each trainee. If the results are in unsatisfactory, then a new personalized course will be created added learning objects and changed the learning sequence according to the emotional and behavioral skills of employee. In the ontology that describes the education and skills will be added new content. Figure 1 shows the conceptual model

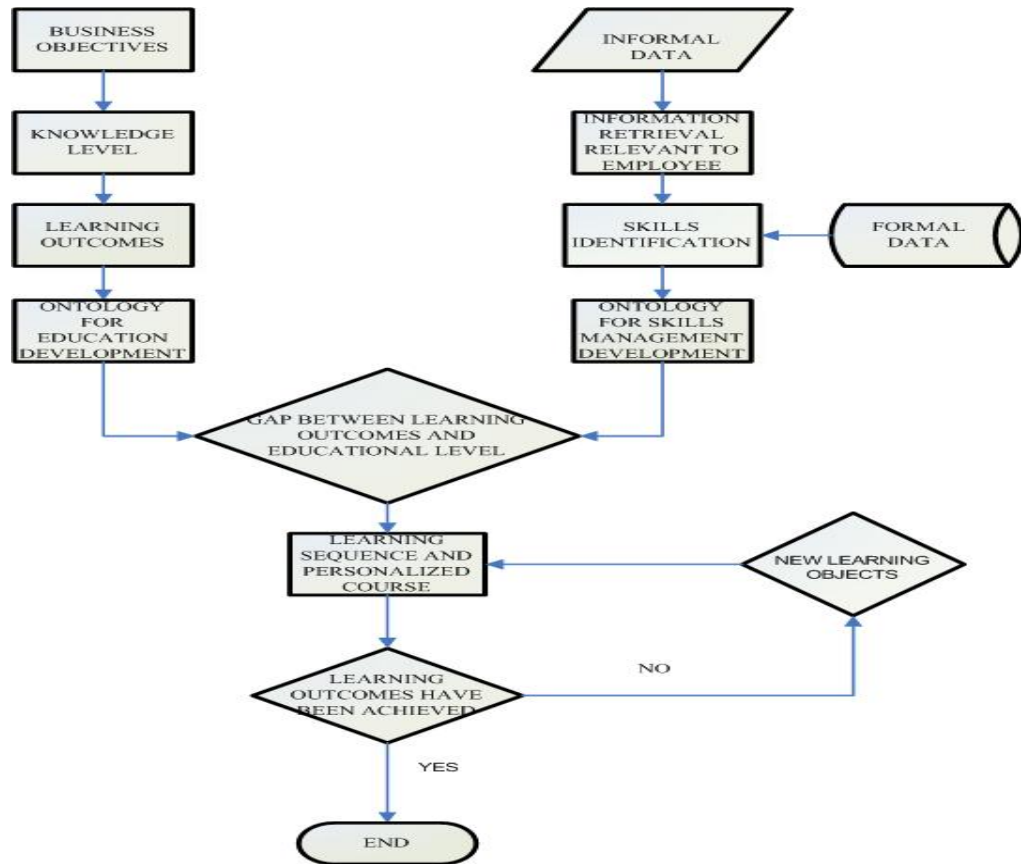


Fig. 1 Conceptual model.

#### 4. Conclusion

A conceptual model has been proposed general for continuous learning for the employees in a dynamic business environment. The presented model offers a very useful set of steps for Human Resource department. The model is supported by an andragogy theory and a set of standards from the Human Resources business unit. A future work has planned to develop semantic matching criteria between the two ontologies, content retrieval from multimedia files and to add reasoning capabilities. Finally the two ontologies will continue to include concepts and axioms of international standards.

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