

Required Professional Training in Operations Management: the AsLongOp.Train Project

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Abstract- In the actual complex environment, the human capital in the organizations are continuously in need of competences development since the products, services, systems and processes of the firms are subject to incremental and/or radical innovation. For that and specially in the field of operations, it is essential to know when exactly there is a need for professional training for both trainers and trainees. The trainers must be informed on when to be ready to provide new professional trainings and the trainees must be aware of their need for professional as a result to specific changes in their organizations. Thus, the paper presents an important project – AsLongOp.Train- investigating on the factors showing there is a requirement for professional training in the operations and designing a software –AsLongOp.Train- enabling trainers and trainees to tell and to know respectively, there is a need for professional training for continuous high performance and customers satisfaction. The software will facilitate and accelerate the information diffusion about the professional training requirement and accelerate the provision of professional training so firms in the environment can pace with its increasing complexity.

Keywords- Operations Management; Professional Training; Intelligent Systems; Agent Modeling

I. INTRODUCTION

The inter-organizational processes of collaboration have various functions and roles and these are the basis of the operations. Every phase of the product development ^[1] and innovation process ^[2] has specific operations for the achievement of the purposes of collaboration. The human capital involved in these operations is continuously in need of competences development and professional training in order to have sustainable competitive advantage.

According to ^[3], in the automotive industry, the professional training and operations management have a simultaneous and concurrent role since as long as there are new products and services launched in the market as long as there is a need for professional training to develop the competences of the after-sales services organizations. The organizations providing professional training must have the adequate systems and tools for providing professional training ^[4] and the learners must have the right capacities for the assimilation of new information and knowledge during the professional training.

Also, the organizations providing professional training must be able to do it at the right time for if the lag factor of

time between the appearance of a first issue in the product or service and a lack of necessary material and information in the side of the trainee is high, this can cause great economic losses and low customer satisfaction. For this reason, the research in this paper investigates on the factors and indicators leading to the recognition of the time there is a need for professional training.

Besides, the high-technological based environment calls for continuous development of intelligent IT-based systems for the acceleration of operations of various types and there are still no IT-based system in the field of professional training and operations management, providing learning systems for the trainees, enabling trainers and trainees to know that a just in time and at the right moment professional training is necessary. For instance, XStrat.Net project ^[5] provides the definition of software able to select the partner in need of learning. However, it does not enable trainees and trainers to know there is a need for professional training and the right moment for it.

Thus, the research in this paper also aims at the engineering of an intelligent IT-based system – AsLongOp- enabling the trainers and trainees to know when there is a need for trainings. The next section of the paper presents the objectives of the AsLongOp.Train project in more details. The third section presents the steps to follow to achieve the research project objectives. The fourth section provides the expected results and future directions.

II. OBJECTIVES OF THE RESEARCH PROJECT

The research project objective (Figure 1) is to create a conceptual framework to investigate and to analyze the indicators and factors related to the need for professional training and the right time for it and in a second step to develop the AsLongOp.Train software able to tell the trainers and trainees this.

The AsLongOp.Train project aims at answering the following research questions:

How do the trainers know when to provide professional training?

What are the factors and indicators showing there is a need for a professional training?

What are the factors and indicators showing the right time for the provision of the professional training?

How can the trainees know when they need a

professional training?

What are the factors and indicators showing there is a need for a professional training?

What are the factors and indicators showing the right time for the provision of the professional training?

What techniques can be used to model these indicators and factors for to create the AsLongOp.Train intelligent agents?

What techniques to use for the engineering of the entire AsLongOp.Train software?

The research project will consist in six main phases:

Investigation on the factors and indicators showing the need for the professional training;

Investigation on the factors and indicators showing the right time for the provision of the professional training;

Design and development of the AsLongOp.Train intelligent agents;

Design and development of the software;

Production and deployment of the software;

Software use and support.

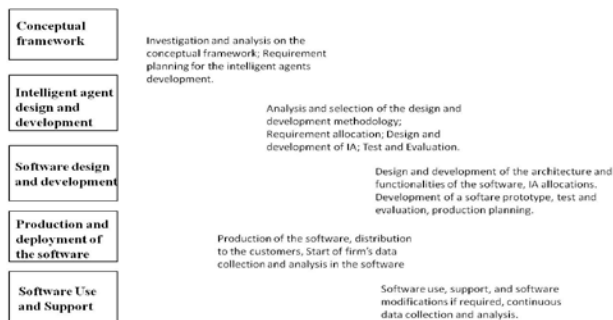


Figure 1 Research objectives

III. DESCRIPTION OF THE RESEARCH PROJECT

The research project consists of three intertwined steps (Figure 2). The first one is the creation of a research framework for the identification of the data, information and knowledge showing the need for professional for both trainers and trainees. The second one is the development of intelligent agent based on these factors and indicators and the last one is the development, testing and deployment of the software [6].

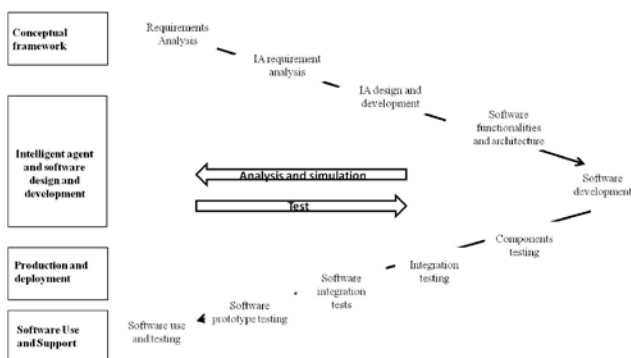


Figure 2 Research phases

A. Conceptual Framework and Requirement Analysis

Factors and indicators for both trainers and trainees: based on literature on change management [21] and innovation management [2], the factors and indicators will be derived (Figure 3). Also, research of [7] on the structural and semantic parameters of e-learning communities is identifying the factors identifying the overlapping among communities. These literatures are relevant for as for instance when there is a new product launched on the market innovative product and new knowledge, there is a change going on in the environment and a possible gap in competences of HR can occur. Thus, the organizations need to learn about these changes and innovations. Also, the following literature is relevant: operations management [8] and human resources management [9] showing the rules and mechanisms leading to the need for optimization, re-engineering and competences development [10, 11] and the research of [12] on the requirements for social software on adaptive learning platforms.

Finally, there are factors and indicators to analyze so to enable the transmission of information the trainee and trainers about new professional training. In this part, literature on marketing and product attractiveness can be used in order to attract trainee attention and awareness about the need for professional training. Also, literature on perceived usefulness and ease of use of objects can be used for this: for instance, the research of [22] on IT acceptance model can be useful in the development of factors and the entire software.

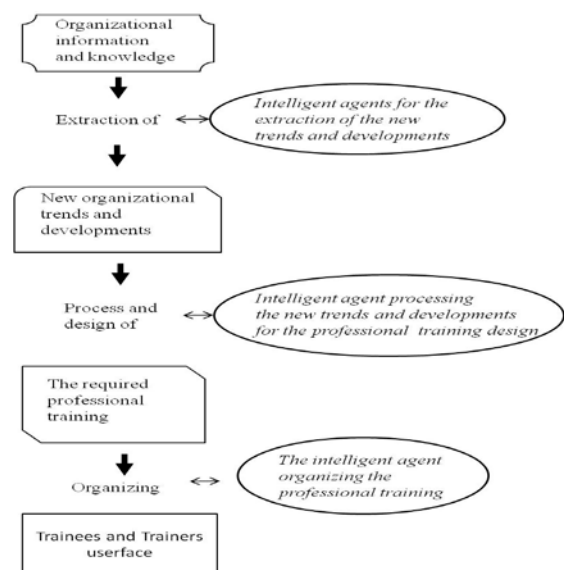


Figure 3 Service oriented architecture

B. Technology-Based Software Development

AsLongOp Intelligent-Agents Design and Development: the factors and indicators derived from the first part of the project are structured through data mining [13] which leads to the classification, categorization, modelling of data and linking the data. Data mining and agent-based modelling are combined [14, 15, 16] for the creation of adaptive and intelligent systems creation [17]. An agent-modelling language and an open source platform composed of the necessary application server and data management system will be selected. These

will lead to the creation of the AsLongOp intelligent-agents models. Also, the development methodology of a learning analytic tool will be used.

AsLongOp Software Design, Architecture and Development. The intelligent agents are the components of the AsLongOp software. This latter will also have additional functionalities dedicated to the integration of the intelligent agents and to the definition of the interfaces and the interactions with the users. For the design of the AsLongOp software, ^[19] architecture is selected and the service-oriented architecture (SOA) is used to create the complex functionalities of the software to facilitate interoperability ^[20] among them and the intelligent agents. This phase will lead to the creation of the AsLongOp multi-agent based service-oriented architecture.

The project also intends to choose the computer science programming language suitable to the engineering of the AsLongOp software. The language should be adapted to the intelligent agents and to the architecture of the software. The unified modeling language (UML) is used. The AsLongOp software must also be compatible with the application server and data management system of the modelled intelligent-agents.

TABLE I THE CONCEPTUAL PILLARS FOR THE RESEARCH FRAMEWORK

Scientific Field	Significance
Change and innovation management	To sustain change and innovation integration, the design of new systems is an optimal strategy.
Operations management	There are systems leading to the development of the work activities in every organization.
HR management	Human capital is constantly in need of new systems for competences management
Technology management	While technologies are developed, specific types of intelligent systems are used

C. Testing, Deployment and Use of the Software

To ensure an optimal software development, the testing of all the components and their integration is necessary. During each phase of the development of the intelligent agents and the software, looking backward to the initial objectives of the project will lead to a decrease in time to final production, deployment and use. A software prototype will be created, after the testing of the software integration. Through the graphic user interface, the AsLongOp software must be able to output to the user when professional training is required. The software also output the information on what type of professional training is needed. The potential users of the software are organizations in all types of industries and sectors. There is no condition on the use of the software by the organizations even though some can have professional training departments and others not-excluding the trainees.

IV. EXPECTED RESULTS OF THE RESEARCH PROJECT

A. AsLongOp Intelligent Agents and Multi-Agent Based Service-Oriented Architecture

The AsLongOp project will be able to provide intelligent agents consisting of data and information about the organizations and that are sensitive since they will contain data and information about the new trends and development for so to allow the software to inform its user about the required professional training. The project will also create its own software architecture –Multi-agent based service oriented architecture- that will be used in the engineering of the software (Figure 3).

B. AsLongOp Software

The AsLongOp project will facilitate and accelerate the information diffusion about the professional training requirement and even provide details about the reason behind the need for it so to allow the trainers and trainees to pace with the dynamic environment. These trainers and trainees will receive information about the type of trainings, the date of the training, the gap in the competences of each trainee and the type of training to be provided by the trainer (Figure 4). The AsLongOp software will be one of the most useful intelligent strategic computer systems widely diffused in all types of industries and sectors.

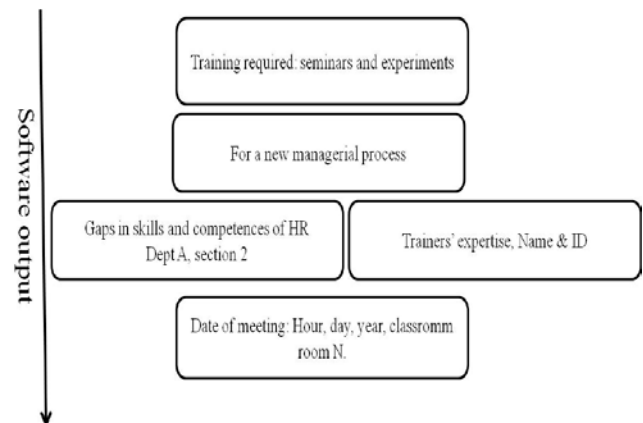


Figure 4 The trainers and trainees interface

V. CONCLUSIONS

The AsLongOp project will have many implications to theory and practice. It will provide many contributions to the literature concerning the integration of change and innovation management with operations and human resources management, and that will be the outcome of the first part of the project in which the factors and indicators will be identified. It will provide new intelligent agents and contribute to IT-based information systems field through the creation of the software and to the development of all types of industries and sectors through its use for the provision of the professional training (Figure 5). Firms will be able to develop their processes of communication and interaction and at the same time improve their processes of collaboration, business and innovation.

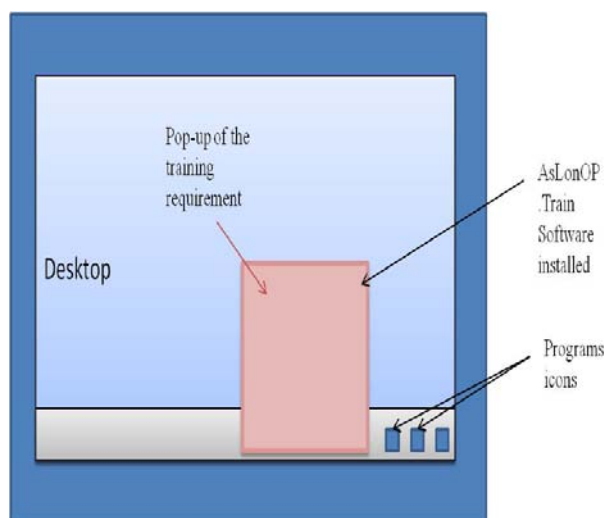


Figure 5 The training requirement

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