A process-oriented and technology-based model of Virtual Communities of Practices: evidence from a case study in Higher Education

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In this paper we hypothesize that community of practices are valuable to Business Schools and Universities because they contribute to the knowledge management cycle for organisational learning. Drawing upon our experience at the e-Business Management Section of Scuola Superiore ISUFI-University of Lecce (Italy), we'll present a process-oriented model of a Virtual Community of Practices (VCoPs), called "Virtual eBMS", together with the description of the integrated e-learning and Knowledge Management platform, along with the description of the services supporting the creation and the development of the community. Finally, some preliminary results and value created through the use of the "Virtual eBMS" will be presented.

Keywords: Higher education, Virtual community of practices, Business Schools, Virtual eBMS, learning in action

1. Virtual Communities of practice as new vehicle for learning in Higher Education

Universities and Business Schools have traditionally had two main roles: creating knowledge and disseminating knowledge. In today's rapidly-changing economic environment, these roles are greatly challenged. The "creative destruction process" of the Schumpeterian terminology [1] involves also the Universities and the Business Schools and calls for radical innovation in their knowledge management practices, learning strategies and organisational processes.

These conditions trigger a rethink of the traditional Higher Education Models: new organizational forms based on Communities of Practices (CoPs) are strongly recommended. There is no doubt that the concept of CoPs is relevant in order to discuss learning approaches in higher education. Wenger's approach gives us the possibility to analyse learning as a social practice that goes on at the micro-social level, largely through engagement in the tasks at hand [1].

Moreover, CoPs are emerging as real enabler of Knowledge Management (KM) processes in Business School, because of:

- The characteristics of the digital economy and of the learning processes, characterised by one hand by outstanding academics or industrial testimonials and students meeting face to face rarely and for limited period of time, and on the other hand the necessity of continuous interaction among these dispersed members.
- The characteristics of the Higher Education: the continuous necessity to improve and update learning materials; the growing heterogeneity of learners coming from different countries; the heterogeneity of the teachers and trainers involved, since they are geographically dispersed, but they should be always interacting; the necessity of updating the learning materials to be used in teaching.

By Community of practices (CoPs) we intend a collections of individuals bound by informal relationship that share similar work roles and a common context [3]. Each of the word in this definition merits close consideration. First, the term "Community" highlights the personal basis upon the relationships are formed. The word further suggest that a communities of practices are not constrained by typical

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geographic, business unit, or functional boundaries, but rather by common tasks, context and work interests. Second, the word "Practice" implies the "Knowledge in action". The concept of practices refers to the dynamic process through which individuals learn how to do their jobs by performing tasks and interacting with others performing similar tasks. But CoPs tipically involved people who where located in the same vicinity; to overcome the typical problems of the dispersion, especially in a Business Schools where the people interact on a geographically dispersed location, it is necessary to take advantage of the Internet technologies. As a consequence, a new typology of communities emerges: the Virtual Communities of Practices (VCoPs).

Can we define an integrated VCoPs model that will support all the knowledge management cycle for the processes of a Business School? In which way the Knowledge management organizational and technological aspects are integrated in a VCoPs? Is it possible to define an integrated e-Learning and Knowledge management platform enhancing learning opportunities both in work practices and in social relations?

2. Toward a conceptualisation of VCoPs in Higher Education: the "Virtual eBMS" Community case

Starting from the issues previously described, we propose an integrated conceptualization for applying KM in Higher Education based on a VCoPs model, supported by the organizational learning processes, as an innovative way to apply KM to higher education. The model named *"Virtual eBMS"* is the result of an empirical study of a higher education community, the e-Business Management Section (eBMS) of Scuola Superiore ISUFI – University of Lecce (Italy). For this study we applied a participative observation [4] because we observed the community, while taking part in it, from November 1999 till September 2006. According to the methodology chosen, researchers actively participated in the eBMS VCoPs meetings, activities and learning processes. The model is the output of the experiences of the eBMS launched in 1999.

2.1 A description of the "Virtual eBMS" Community model

We define the "Virtual eBMS" Community as an integrated web based learning environment, in which thinking, studying and acting are strongly correlated to reinforce and improve the effectiveness of the knowledge creation processes, starting from the concrete experience of the participants.

The model explains the knowledge management cycle processes as they happen in a VCoPs, and it is supported by an integrated e-learning and knowledge management platform. The holistic model of the Virtual eBMS is composed of 7 main elements, showed in Fig. 1, that lays at different levels, but that interact bi-directionally and continuously, enabling the community participants (INPUT) to benefit from a variety of value (OUTPUT).

Participants	**Community characteristics**	**Primary Outcomes**
Staff; Student; Lecturer; Partner; Testimonial; Alumni; Visitor.	*1) Primary aim* *2) Value Proposition* *3) Primary values* *4) Knowledge Sources* *5) Knowledge management cycle* *6) Governance structure* *7)Virtual eBMS system*	*Value for Higher Education processes.*

Fig. 1 The VCoPs model of the "Virtual eBMS".

1) ***Primary aim:*** "sponsor" the continuous development of its participants' core competencies (mainly postgraduate students and researchers) through their participation in research activities strongly integrated with higher education educational programs.

2) ***Value proposition:*** enhance intellectual capital creation in the Business School. By intellectual capital we adopt the following definition [5]. Intellectual Capital could be framed in three interdependent elements: human, social, and structural capital. Human capital is defined as knowledge, skills and attitudes created in people. Social Capital reflects the ability of groups to collaborate and to work together and is a function of trust. Structural capital is usually defined as buildings, software, processes, patents, organization's image and values, information system, databases.
3) ***Primary values:*** commitment and trust, open communication, continuous problem solving, homogeneity of values, Learning in action.
4) ***Knowledge sources****: domain knowledge.* In a Higher Education institutions knowledge can be organized around domains - specialized areas of knowledge, subject areas, disciplines, frequently used information and similar characteristic knowledge.
5) ***Knowledge Management cycle***: *The knowledge sharing* retrieves knowledge from the organisational memory and makes it accessible to the users. Individuals, teams and laboratories often share ideas, opinions, knowledge & expertise in meetings held in face-to-face format or virtually. Organisational memory resides in three different forms: in human minds, on paper and electronically. The *knowledge organisation* stage takes the nuggets of knowledge and classifies them and adds them to the organisational memory. Much of this knowledge can be represented in electronic form as expert systems. This is where even tacit, intangible knowledge assets are transformed to tangible one. The "Virtual eBMS" approach to *knowledge creation* is based on a self-organizing kind of learning, derived from direct experience, as it is exposed in Kolb's theory of experiential learning. According to Kolb [6], the first step in learning is to motivate learners; learning is no longer considered as a classroom-specific activity, but is regarded as a continuous on-going process where the pivot actors of the process are the learners. The philosophy is that students learn best not only by receiving knowledge but also by experimenting it, interpreting it, and learning through discovery while also setting the pace of their own learning. Teachers coach and mentor students to facilitate their learning, designing experiences through which students acquire new knowledge and develop new skills. Faculty members serve as facilitator of learning rather than teachers/lecturers of all the knowledge necessary to strength the project. Following this philosophy, we set up the technological systems supporting our Virtual eBMS.
6) ***Governance Structure:*** mid level control from leaders and coordinators (director and laboratories coordinators).

2.2 An integrated process and technology oriented description of the "Virtual eBMS" Community

7) ***Virtual eBMS System****:* The integrated e-learning and knowledge management system is a web-based platform, supporting the Virtual eBMS community. Such complex system, was created by integrating different market products and some components developed ad hoc; at the base of the KM and the e-learning system integration process there is the use of open source technology. The taxonomy-based organization of the learning materials, on the base of a dynamic and extensible "ad-hoc" competence taxonomy, allows the learners to quickly search and get small pieces of self-consistent learning objects. Such learning objects can be easily organized into customized learning patterns and delivered on demand to the user, according to her/his profile and knowledge needs, giving flexible access to the learning materials [7]. In the following Table 1 an integrated process and technology oriented view of the Virtual eBMS systems is offered. For each community process and actions (Knowledge organisation, knowledge creation, knowledge apply and knowledge sharing) are given the correspondent main functionalities of the Virtual eBMS, grouped in content management systems, content delivery systems, learning management systems and administration functionalities.

Table 1. A process and technology oriented view of the "Virtual eBMS" Community

	THE VIRTUAL EBMS COMMUNITY SYSTEMS FUNCTIONALITIES		
COMMUNITY PROCESSESS AND ACTIONS	**Content management system**	**Content Delivery system**	**Learning Management systems**
KNOWLEDGE ORGANISATION O1. Storing community knowledge O2. Know who is in the community and the domain of expertise O3. Developing Knowledge maps O4. Quickly and systematically find the right information	Creation and management of knowledge objects, metadata management, document search and retrieval. Automatic indexing of unstructured content, automatic categorization to a taxonomy and automatic creation of taxonomies to provide content in context. E-library, document management , search (full text, taxonomies, knowledge map, recommendation).	Free search of leaning resources: full-text and taxonomy search of learning resources (Knowledge Objects, SCORM Objects, Learning Modules, Learning Plans), both from mentors (back-office area) and from learners (front-office-area)	Deliverable submission by learners, deliverable approval/reject by mentors. Course Tracking: SCORM Objects on-line/off-line tracking. In the off-line mode: course download and attend, synchronization with the e-Learning system
KNOWLEDGE CREATION C1. Situating learning into daily work practices C2. Proving just in time learning C3. Providing content specific solutions to problems C4. Create competences according to the personal profile	Creation and management of tests. Textual and graphic report on learner activities and results, as well as on the usage of resources and learning material. Skill gap Analysis: analysis of learner competence-gap based on self-assessment.	Competences management through a three-level competences taxonomy. *Learning module management:* creation and management of learning modules, by assembling multimedia presentations, Web resources, knowledge objects, SCORM objects, virtual events.	Creation and management of learning plans by assembling learning modules, glossary management, multimedia presentation management.
KNOWLEDGE APPLY A1. Debriefing after attending seminars or important meeting with geographically dispersed partners. A2. Documenting knowledge into manuals, deliverables, papers, diagrams. A3. Having access to specialised libraries. A4. Access to on line repository of files.	A relational or object-oriented repository of content and activities, which allows granular storage content, with descriptive and category metadata to facilitate retrieval. Management of individuals, competencies, expertise, temporary and permanent groups/ communities.	Enrolment Requests: learners can send a request of enrolment to their mentors for learning modules and learning plans Management of resources and facilities for training, meetings, etc.	Assessment of competence acquisition through tests (automatic) and/or deliverables (by mentors). Learning catalogue available for: Knowledge Objects, SCORM Objects, Learning Modules, Learning Plans.
KNOWLEDGE SHARING S1. Stimulate Dialogue S2. Embed Know-how Sharing into work practices S3. Mentoring, coaching and other forms of action learning S4. Running internal seminars led by experts S5. Virtual meeting	One to one communications tools (chat, e-mail); one to many communication tools (forum, questionnaires) One to all communications tools (news, bookmark, blackboard)	Support and Feedback: support to learning activities of learners by tutors/facilitators.	*Pedagogical Relations Management:* creation and management of pedagogical relations with which to create some logical and propaedeutic links between learning content.

3. Conclusions: VCoPs Values created

VCoPs enable an efficient and effective process of Knowledge creation through the sharing of knowledge with a wide range of members and enhance experiential learning process which is widely

recognized in the literature as essential for action learning [8][8][9]. The Virtual eBMS supports the interconnectivity allowing access of different cultural environment, provide linkages to reference materials, resource people on a global scale, provide feedback from staff, learners, alumni, experts and industry partners, improving responsiveness by monitoring and incorporating lessons learned from the experiences of colleagues, student evaluations, and corporate or other constituent input. We would like to conclude this paper by describing the primary outputs of the community, identifiable in the value created by the community and in the attributes that create values. The future developments steps of the work, will consist in the identification of a mechanism to aliment and sustain the community.

Table 2. The valued added by the Virtual eBMS Community

Nature of Value Added	Attributes that create Value
Higher quality of knowledge creation	– Reflection process that occur at the end of a virtual meeting consolidates learning – Leveraging of previous research and proposal efforts – Diversity in membership and less emphasis on hierarchical status increase the probability of group think
Greater capacity to deal with unstructured problem	– Research activities occur under a set of super ordinate goals rather than task goal – Knowledge leaders are allowed to emerge on the basis of issues rather than by assignments to a team or roles within a teams
More effective knowledge sharing among research laboratories	– Voluntary participation implies higher motivation that turn leads to faster, deeper internalization of learning – Long term relationships increase trust
More effective knowledge delivery	– Self paced and not sequential, independent learning via resource-based and technology enhanced activities: many methods of learning, many media, varied resources, self-test, formative evaluation, critical thinking – Lecturer are just facilitator for students experimenting new knowledge
More effective improved individual development and learning	– Active learning as part of a group is more effective than learning alone – Learners' choice are competency-based – The opportunity to learn engaging in practice is embodied in processes that the community developed – Support collaborative projects among different research laboratories
Course design	– Offer flexible, multidisciplinary and non sequential learning – Stimulate and engage learners via well crafted learning issues – Interdisciplinary curriculum design and development facilitated by navigating across laboratories

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