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Process-Oriented Learning Requirements for Employees and for Organizations

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***Abstract*—**Using activity theory, organisational theory and didactics as theoretical foundations, a comprehensive model of the organisational dimensions relevant for learning and knowledge transfer will be developed. In a second step, a Learning Assessment Guideline will be elaborated. This guideline will be designed to permit a targeted analysis of organisations to identify the status quo in those areas crucial to the implementation of learning and knowledge transfer. In addition, this self-analysis tool will enable learning managers to select adequate didactic models for e- and blended learning. As part of the European Integrated Project "Process-oriented Learning and Information Exchange" (PROLIX), this model of organisational prerequisites for learning and knowledge transfer will be empirically tested in four profit and non-profit organisations in Great Britain, Germany and France (to be finalized in autumn 2006). The findings concern not only the capability of the model of organisational dimensions, but also the predominant perceptions of and obstacles to learning in organisations.

***Keywords*—**Activity theory, knowledge management organisational theory, "Process-oriented Learning and Information Exchange" (PROLIX).

I. Learning and Knowledge Transfer in Organizations

IN many organisations and enterprises, the training and learning opportunities offered and the possibilities for generating and transferring knowledge do not adequately fit actual business needs. They are often either made available at too late a stage or do not focus on the individual's actual needs for effectively fulfilling their role in the business process. Consequently, the training offered is not accepted by the workforce since it meets neither their own business needs nor indeed those of the enterprise.

In addition, company management is often not fully aware of the type of knowledge and competencies needed to run its business (processes) properly. As a result, organisational and process changes are frequently decided without awareness of the impact of the gaps in competencies that might subsequently be opened. Furthermore, learning opportunities and support services to accompany modified processes often lack appropriate definition.

With these obstacles in mind, the overall objective of the European Integrated Project "Process-oriented Learning and Information Exchange" (PROLIX) is to align learning with business processes, thereby enabling organisations to improve their employees' competencies more quickly and better in line with continuing changes in business requirements. However, to ensure maximum effectiveness, PROLIX also has to look beyond simply developing tools and methods and give appropriate consideration to the specific organisational environment in which such tools and methods are to be implemented and used.

Furthermore, the adequate planning of learning measures and selection of appropriate didactic models has to incorporate the specifics of a particular organisational environment. A learning assessment guideline builds the basis for integrating the status quo of crucial organisational dimensions into learning and knowledge transfer.

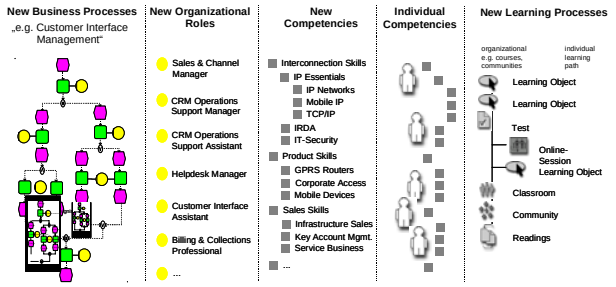

Fig. 1 Learning as a key enabler for business process management and change

II. The Impact of Organisational Characteristics

From a mechanistic point of view knowledge may be regarded as an easily transferable commodity. By contrast approaches like situated learning emphasise the social context of learning processes and knowledge as socially constructed [7]. Research findings suggest that the use of data and information in organisations is dependent on the subjective interpretation of those individuals and groups who will transform these inputs into actions and performance. For this reason, companies must influence and support knowledge management capabilities in several different areas (e.g. leadership and company culture) by deploying and integrating available methods, instruments and technologies to provide a beneficial environment for the use and creation of knowledge

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and competencies [12], [3], [8]. In doing so, organisations must also actively encourage and support participation. Since individuals can be seen as operating both independently and interdependently, it is their socially-derived personal history, values and ways of knowing that mediate how they participate and learn in social practice, e.g. in the workplace. They need to find meaning and value in the learning activities offered. Inconsistencies between workplace values and employee values may lead to resistance. Different skills, abilities and ways of motivating employees to participate are required, for example to attract the interest of and motivate reluctant participants. Opportunities to participate and receive support seem to be essential for achieving rich learning outcomes, see [1].

III. Activity Theory as an Analysis Framework

Activity theory will be the main framework for the analysis. It focuses on the interaction between human activity and consciousness within its relevant environmental context. It provides an appropriate framework for analyzing learning needs, tasks and outcomes within organisations. The socio-cultural, socio-historical lens of activity theory helps managers and designers of workplace learning to analyze human activity systems. A fundamental assumption of this approach is the understanding that conscious learning emerges from activity instead of being prior to it [6].

An activity system may be visualized by a triangle as showed in Fig. 2. The small triangle on the top describes an activity which produces some object. "The production of any activity involves a subject, the object of the activity, the tools that are used in the activity, and the actions and operations that affect an outcome" [6], see also [11]. The subject is an individual or group engaged in the activity. The object is a physical or mental product which serves the attainment of a specific goal. "The object is depicted with the help of an oval indicating that object-oriented actions are always, explicitly or implicitly, characterized by ambiguity, surprise, interpretation, sense making, and potential for change" [4]. Tools are mediating between the subject and the object and may be anything physical or mental used in the transformation process. "The use of culture-specific tools shapes the way people act and think. […] the tools alter the activity and are, in turn, altered by the activity" [6]. The community shares a set of social meaning and rules which guide the activities acceptable by the community. "The division of labor prescribes the task specialization […] by individual members of groups within the community or organization" [6].

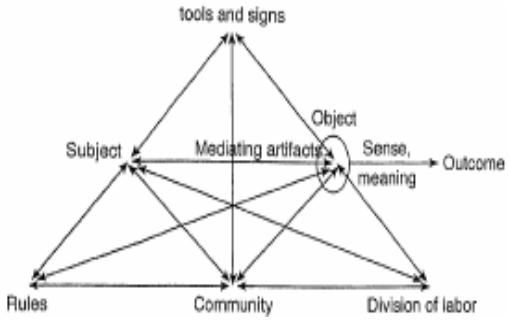

Fig. 2 Activity System [4]

The following five principles can be used to summarize the current shape of activity theory. The first of these principles is "that a collective, artifact-mediated and object-oriented activity system, seen in its network relations to other activity systems, is taken as the prime unit of analysis" [4]. The second is the multi-voicedness of activity systems and the inclusion of different points of view. Historicity, the third principle, indicates that activity systems take shape and become transformed over longer periods of time. The central role played by contradictions as sources of change and development is the fourth principle, while the fifth principle "proclaims the possibility of expansive transformations in activity systems" [4], see Fig. 3.

	Activity system as unit of analysis	Multi-voicedness	Historicity	Contradictions	Expansive cycles
Who are learning ?					
Why do they learn?					
What do they learn?					
How do they learn?					

Fig. 3 Matrix for the analysis of expansive learning [4]

IV. Applying Activity Theory

The application of activity theory may be structured in six steps as proposed for the design of constructivist learning environments by [6]. The first step aims at the clarification of the participants´ goals and motives. It is important to understand the context in which activities occur, their motivations and interpretations of perceived contradictions in the system.

The second step analyzes the activity system as such. It is necessary to define the acting subject(s), the relevant community or communities and the object, the expected outcome.

Step three focuses on the structure of activities. Exemplary

topics are, how the work is being done in practice and what norms, rules and procedures in the actions and operation have been documented.

Subject, community and object as components of the activity systems do not interact directly. They are mediated by signs and tools (physical or mental) which provide the direct and indirect communication between the subjects. These mediators describe the constraints of the activity and are questioned in step four. It has to be understood which tools are used in this activity and how they are used.

In step five the very important aspect of the context of the activity is analyzed. It may be differentiated in the internal or subject-driven (e.g. beliefs, assumptions, models and methods) and the external or community-driven contextual bounds (e.g. freedom of entering a working group, structure of social interaction).

The final step of activity analysis assesses how the components affect each other, how the interrelationships look like.

V. Organisational Prerequisites for Learning and Knowledge Transfer

The success of instruments and methods aimed at developing knowledge and learning is influenced by both the characteristics of the organisation in question and the cognitive habits of its employees. Within the Knowledge Management discourse a number of different models have been developed to identify and structure the areas relevant for the development of knowledge in organisations. Four such models and the structures they propose are described briefly below and will be integrated in the activity theory model.

A. IPK Model of Knowledge Management

The Fraunhofer IPK knowledge management model includes the following six "design fields", see [9]:

- corporate culture
- leadership
- information technology
- process organisation
- controlling
- human resource management

B. Organisational Dimensions

Mingers takes a pragmatic perspective in characterising the comprehensive spectrum of dimensions which impact an organisation's ability to use and develop its knowledge effectively as follows, see [10]:

- Strategies: business strategy, learning and knowledge goals and visions, etc.
- Structures: incentives, career opportunities, means of communication, etc.
- Processes: process management, learning and knowledge processes, transparency of decision-making, etc.
- People: systematic human resource management, free play for activity and creativity, etc.
- Corporate culture: values that foster or hamper the sharing of knowledge, gender equality, communication habits, cooperation and confidentiality, etc.
- Information and communication technologies (ICTs): information management, intranet, internet, different needs of men and women in ICTs, etc.
- Space: spatial opportunities for communication and interaction.

C. Knowledge Management Assessment Method

Bornemann/Sammer propose an assessment methodology covering the following four levels of knowledge management, see [2], Fig. 4:

- goals level
- knowledge level
- business processes level
- data level.

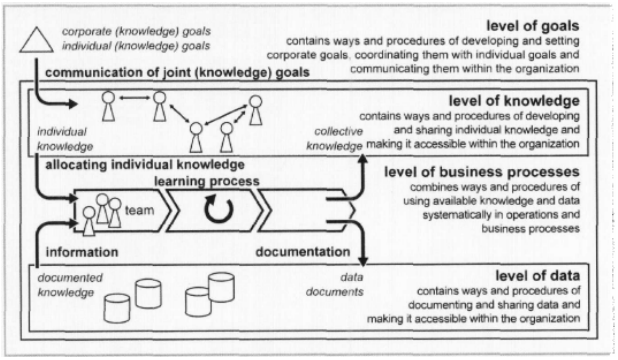

Fig. 4 Different levels of knowledge management [2]

D. KM Assessment

The KM Assessment developed by the European KM Forum is divided into the following major sections, see [5]:

- General
- KM Strategies
- Human & Social KM Issues
- KM Organisation
- KM Processes
- Technologies
- Leadership
- Performance Measurement
- Implementation
- Business Cases.

VI. Learning Assessment Guideline (LAG)

The Learning Assessment Guideline under development in the project PROLIX will be based on an integration of both approaches described above, activity theory and knowledge management. The assessment will enable organisations to diagnose their ability to successfully apply process-oriented learning and knowledge transfer. It will also indicate which specific areas in the organisation are particularly critical for achieving the goals set by the PROLIX project. This

assessment will allow the person responsible for learning management (e.g. human resource management, trainers) to analyse the actual organisational environment in which process-oriented learning is to be implemented. Even though it is not possible to define target states and actions that will be universally valid for every organisation or organisational area, recommendations can be given for suitable didactic models and measures in key areas on the basis of a learning assessment.

The analysis focuses on aspects relevant for learning and knowledge management. In this way, the person responsible for learning and knowledge management obtains an overview of learning maturity in the different organisational dimensions as well as recommendations for measures to improve the current status. Information on the appropriateness of didactic strategies for specific organisational environments will be included in the descriptions of the didactic models suggested by the system.

VII. Interviews for the Development of Learning Assessment Guideline

The design and evaluation of the LAG in the test environments in the publishing, telecom and public sector needs two empirical phases. The first phase (face-to-face and written interviews) is intended to gather the crucial information relevant for the implementation of process-oriented learning with a focus on a management perspective. The second phase (an online survey) aims at an employees' perspective on workplace learning.

A. First Phase – Interviews with Managers

For the development of the learning assessment guide, qualitative interviews with managers responsible for Human Resource Management and employees who design training for the workforce were conducted. In one organisation the method of face-to-face interviews was used, while in others written interviews were preferred. This questionnaire dealt with further education (e.g. training, knowledge acquisition, seminars,..) of employees and learning organisations. The questions focused on the following topics:

- Further education in general, realisation and content
- Employees and their competencies
- General framework of the organisation
- Basic conditions for eLearning

Examples for questions are:

- Please describe a typical further education in your organisation. (How was it planned, conducted and evaluated?)
- How do you analyse the competencies of your employees? (Do you use uniform forms?)
- How important is the development of new knowledge in your organisation? (To what extent makes the management arrangements to support that?)
- How many employees do have a desktop PC or Laptop?

The results provide empirical input for the design of the LAG. Presently six interviews with managers were conducted and analysed, further six interviews are pending.

B. Second Phase – Online Survey with Employees

To improve and evaluate learning assessment guidelines it is intended to develop an online survey with employees. These employees work in the particular subdivision and will act as the test bed for PROLIX. The aim is to test the LAG and to provide empirical data for the selection of didactic models.

- To which extent are you motivated to attend further education?
- Dou you talk with your boss, if you would like to attend further education?
- How are exchange of experience and knowledge between you and your colleagues supported?
- To what extent do you learn with each other or alone?

In August 2006 the online survey will be finalised. The empirical study will be finished presumably in September 2006. The results will represent the status quo of an organization regarding the prerequisites for process-oriented learning and knowledge transfer.

VIII. Model of the Organizational Dimensions Relevant for Learning in Organizations

Based on previous work in this field, the authors propose a comprehensive model of the organisational dimensions relevant for learning and knowledge transfer. This model will cover several of the dimensions identified as crucial for both assessing the status quo and determining future intervention steps, and includes the following areas:

- Relevant characteristics of the target groups / users
- Strategy, controlling
- Organisational culture, leadership
- Storage and of processing of data, information, information and communication technology
- Human resource management
- Processes, organisational structures
- Work design, office architecture

This comprehensive model may be combined with activity theory as described above (see Fig. 5). Doing so we may integrate the organisational dimensions and aspects proposed in the context of knowledge management and activity theory. This approach will be tested empirically at the test beds of the PROLIX project.

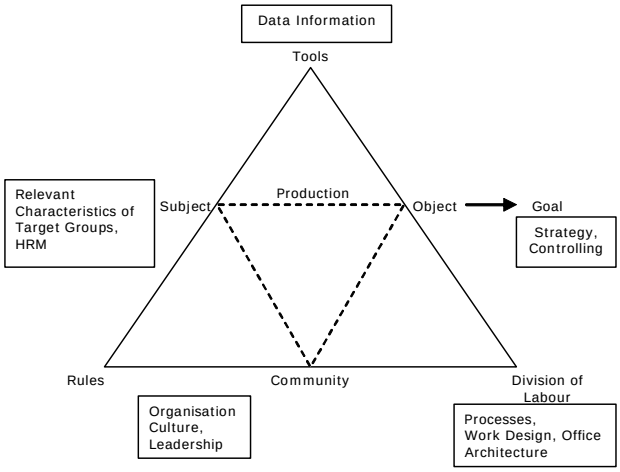

Fig. 5 Model of the organizational dimensions relevant for learning and knowledge transfer within an activity system

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