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Beyond Knowledge Management -- Introducing a Framework for Learning Management Systems

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BEYOND KNOWLEDGE MANAGEMENT – INTRODUCING A FRAMEWORK FOR LEARNING MANAGEMENT SYSTEMS

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Abstract

In the knowledge economy, a firm's intellectual capital represents the only sustainable source of competitive advantage. Intellectual capital manifests itself, predominantly, in the individual and collective competencies of employees in organizations. Hence, the ability to learn and to manage learning becomes critical to the success of organizations. Firm's adopting knowledge management initiatives seek to facilitate the sharing and integration of knowledge. This approach has had limited success, primarily because of its focus on 'knowledge as a resource' rather than on 'learning as a people process'. A strategic 'people-oriented' approach to the management of learning is now emerging in many organizations and a new breed of information system (IS), the 'Learning Management System' (LMS), is being used to manage organizational learning. As with previous IS innovations, such as Enterprise Resource Planning (ERP) systems, industry practitioners and IT vendors, are addressing the 'Learning Management' challenge; consequently, there is a paucity of empirical research on LMS in the IS field. It is well-accepted that with little researched or understood phenomena, a research framework is required to identify fundamental constructs and variables so that such phenomena can be rigorously studied. Based on an exhaustive analysis of previous research and an extensive case study of an LMS implementation, this paper proposes a conceptual model and framework that delineates a role for LMS with respect to theories that deal with knowledge and learning management and IS which are argued to support learning and knowledge management in organizations. In so doing, this study highlights the roles that LMS can play in the support and management of learning within knowledge-intensive business enterprises.

Keywords: Learning Management, Theory Building, IS Research, Knowledge, Learning in Organizations, Organizational Learning.

1 INTRODUCTION

Many definitions of 'organizational learning' have been articulated. Perhaps, the most succinct of these is that of Fiol & Lyles (1985, p. 803) who state that *"Organizational Learning means the process of improving actions through better knowledge and understanding."* Harvey & Denton (1999) identify several antecedents which help to explain the rise to prominence of organizational learning, viz.

- The shift in the relative importance of factors of production away from capital towards labor and intellectual capital, particularly in the case of knowledge workers.
- The ever more rapid pace of change in the business environment.
- Wide acceptance of knowledge as a prime source of competitive advantage.
- The greater demands being placed on all businesses by customers.
- Increasing dissatisfaction among managers and employees with the traditional command control management paradigm.
- The intensely competitive nature of global business.

A new breed of Information Systems (IS) known as Learning Management Systems (LMS) are evolving to enable learning in organizations (Brennan & Funke & Andersen 2001, Hall 2001, Nichani 2001, Greenberg 2002). In essence, LMS replace isolated and fragmented learning programs with a systematic means of assessing and raising competency and performance levels throughout the organization, by offering a strategic IS solution for planning, delivering and managing all learning events including both online and classroom-based learning (Greenberg 2002). Practitioners recognize the need for such systems, and this is reflected by the fact that many world-class organizations are employing learning management to foster and manage learning within their organizations. These include Amazon.com, Cisco Systems, Continental Airlines, Deloitte Consulting, EDS, Ford Motor Company, General Electric, and Procter & Gamble[1].

This new strategic approach to managing learning means that the future looks brighter for organizations whose very survival depends on their ability to learn and adapt quickly to constantly changing business environments. However, the 'learning management' approach has been led primarily by practitioners and IT vendors and there is a dearth of empirical research in this area. Therefore, an important challenge for the IS field is to better understand LMS and to examine the roles and relationships of these new systems within organizations. This paper proposes a framework which puts LMS in context in relation to the key theories and categories of IS that underpin learning in organizations. The framework is based on an initial theoretical model drawn from an extensive analysis of the literature and empirical validation in a single case study of the implementation of an LMS by a major multinational enterprise[2]. It is hoped that this framework will deepen the IS field's understanding of the contribution of LMS to learning within organizations and will guide future research in the area.

2 LEARNING IN ORGANIZATIONS: SIGNIFICANCE AND COMPLEXITY

The importance of learning and management of learning in organizations are well accepted. Zuboff (1988), for example, argues that learning, integration and communication become key to leveraging employee knowledge; accordingly, she maintains that managers must "*switch from being drivers of people to being drivers of learning.*" As Argyris & Schön (1996) point out, "*there is a virtual consensus that we are all subject to a 'learning imperative', and in the academic as well as the practical world, organizational learning has become an idea in good currency.*" The organizations

[1] http://www.saba.com/english/customers/index.htm
[2] For reasons of confidentiality, this organization cannot be identified

that will truly excel will be those that discover how to tap people's commitment and capacity to learn at all levels in the organization (Senge 1990, Butler 2002).

Learning, however, is a complex phenomenon and the concept of learning within organizations has numerous dimensions, making it even more complicated than individual learning. Three primary types of learning in organizations have been identified, namely *Single-loop, Double-loop* and *Triple-loop* (Cyert & March 1963, Argyris & Schön 1978, Snell & Chak 1998). Multiple levels of learning have been distinguished, including *Individual Learning, Group Learning* and *Organization Level Learning* (Fiol & Lyles 1985, Levitt & March 1988, Nonaka 1994) and several processes of learning within an organizational context have been differentiated. Among these are *Knowledge Acquisition, Information Distribution, Information Interpretation* and O*rganizational Memory* (Huber 1991, Crossan et al. 1999). Finally, the various influences of a range of social and cultural issues on learning within organizations has been delineated, especially those that influence perspective making and perspective taking within '*communities-of-practice'* or *'knowing'* (Boland & Tenkasi 1995, Lave & Wenger 1991, Brown & Duguid 1991).

In addition to organizational learning theory, the practices of learning and learning management in organizations, has been influenced by a number of other theories, viz.

- Competence theory or the resource-based view of the firm, which argues that an organization is made up of a collection of competencies that embody its knowledge (Penrose 1959, Nelson & Winter 1982, Teece & Pisano & Shuen 1990, Prahalad & Hamel 1990). Nordhaug (1994) describes how competencies are acquired and applied within organizations and calls this 'the competence chain'.
- Intellectual capital theory, which describes intellectual capital as the possession of the knowledge, experience, technology, relationships and skills that provides a competitive advantage (Edvinsson & Malone 1997, Sveiby 1997, Stewart 1997). Intellectual capital is made up of both human capital (i.e. knowledge, skills, innovativeness, company values of employees) and structural capital (i.e. customer relationships, organizational technology, organizational structures and processes).
- Knowledge management theory, which is led primarily by technologists and was developed as a managerial response to trends associated with post-industrialism, including technological advances, flatter organizational structures and virtual or networked organizations (Scarbrough & Swan 2001, Alavesson & Kärreman 2001). Such organizations may lose the opportunity for casual sharing of knowledge and learning induced by physical proximity. The field of knowledge management is further split into two perspectives, namely; those interested in the technology aspects; and those interested in the 'people side' of knowledge management. Nonaka & Takeuchi (1995) concentrate on 'knowledge creation' as opposed to knowledge management, and argue that knowledge is created by the interaction and conversion of two types of knowledge, that is, explicit knowledge and tacit knowledge.

3 DEFICIENCIES IN THE KNOWLEDGE MANAGEMENT APPROACH

During the 1990s, there was a major shift in focus from organizational learning to knowledge management, in both applied and theoretical contexts (Easterby-Smith & Crossan & Nicolini 2000, Thomas & Sussman & Henderson 2001, Scarbrough & Swan 2001, Alvesson & Kärreman 2001). Knowledge Management Systems (KMS) seek to facilitate the sharing and integration of knowledge (Alavi & Leidner 1999, Chait 1999, Garavelli & Gorgoglione & Scozzi 2002). However, these systems have had limited success (Shultz & Boland 2000) with reported failure rates of over 80% (Storey & Barnett). This is because many of them are still, for the most part, used to support data and information processing, rather than knowledge management (Borghoff & Pareschi 1999, Sutton 2001, Hendricks 2001, Garavelli et al. 2002, Butler 2003) and also because many implementations neglect the social, cultural and motivational issues that are critical to their success (McDermott 1999, Schultze & Boland 2000, Huber 2001). Indeed knowledge management may be more of a new 'fashion' or 'fad' that has been embraced by the IS field (Swan & Scarborough & Preston 1999, Butler 2000,

Galliers & Newell 2001) and its popularity may be heightened by glossing over the complex and intangible aspects of human behaviour (Scarborough & Swan 2001).

4 NEW POTENTIAL OFFERED BY LEARNING MANAGEMENT SYSTEMS

It is perhaps time to admit that neither the 'learning organization' concept, which is people oriented and focuses on learning as a process, nor the knowledge management concept, which focuses on knowledge as a resource, can stand alone. These concepts compliment each other, in that the learning process is of no value without an outcome, while knowledge is too intangible, dynamic and contextual to allow it to be managed as a tangible resource (Rowley 2001). She emphasizes that *"successful knowledge management needs to couple a concern for systems with an awareness of how organizations learn."*

Researchers believe that what is needed is to better manage the flow of information through and around the "bottlenecks" of personal attention and learning capacity (Wagner 2000, Brennan et al. 2001) and to design systems where technology is in service to and in support of diverse learners and diverse learning contexts (McCombs 2000). In response to this need, a new breed of systems known as Learning Management Systems (LMS) have evolved, and many firms are now using LMS technologies to take a new approach to learning within organizations. While KMS are specifically designed to facilitate the sharing and integration of 'knowledge', LMS, in contrast, are designed to maximise learning within the organization. This is achieved by helping employees to plan and gauge their own learning progress, while also helping administrators and management to target, deliver, track, analyze and report on their employees' learning condition within the organization (Nichani 2001). More sophisticated LMS allow for competency mapping and even facilitate career development paths, by measuring an individual's competency level via skill-assessment tests and then guiding the user to the most appropriate course to fill any skill gap (Brennan et al. 2001).

Furthermore, LMS are often coupled with Learning Content Management Systems (LCMS) which facilitate the management and administration of the learning content for the online learning programs, in the form of learning objects (Brennan et al. 2001, Nichani 2001, Greenberg 2002, Jacobsen 2002). It is argued that one of the key benefits of learning objects is the ability to personalize learning on demand by locating and accessing learning material in the form of components that are smaller than the entire course; and the second key benefit is the improved efficiency in developing and maintaining content, because learning objects may be reused and easily updated (Wagner 2000, Lenox 2001). Ultimately, these LCMS may be used to store knowledge objects as well as course component objects, thus allowing knowledge chunks to be used as building blocks for electronic learning and enabling knowledge management and Learning Management to be combined into one integrated program, process, philosophy and approach (Hall 2001, Aldrich 2001, Brennan et al. 2001).

5 LMS IN CONTEXT: TOWARDS A BETTER UNDERSTANDING

According to Whyte (1984), the first step in useful fieldwork and theorising is to develop a well oriented theory. Crossan, Lane and White (1999) point out that a framework defines the territory and takes us a step closer towards a theory. A framework identifies the main items to be studied, the key factors, relevant constructs or variables, and the relationships between them (Robson 1993, Miles and Huberman, 1994). It should assist researchers select areas on which to focus, highlight what data are going to be collected and analysed (Robson 1993, Whyte, 1984), and not exclude data whose importance is not recognised *a priori* (Whyte 1984). Furthermore, it is maintained that a young field such as IS requires "pre-theory" frameworks to guide research activities while enroute to theory development (Bariff & Ginzberg 1982, Teng & Galetta 1991, Checkland & Holwell, 1998). In the following subsections, LMS are placed in context and then a 'theory and practice' framework is described which highlights the concepts, dimensions and variables of interest that should be considered when researching LMS.

5.1 Managing and Facilitating Learning – A Meta Model

Figure 1 emanates from an analysis of the literature introduced in Sections 2 to 4 of this paper and simply places LMS in context in relation to the key theories and categories of IS that underpin learning in organizations. The relevant theoretical influences are shown on the periphery of the model and the major categories of IS which support learning in organizations are all indicated at the core of the model. IS categories are separated only by dotted lines, indicating that there are a lot of interconnections and indeed, overlap between them.

The model also considers the propensity of each of the theories and categories of IS in relation to either a people focus or a resource focus. Their positioning on the x-axis indicates the degree to which they are oriented towards a people or community focus at one end of the continuum; and a resource or knowledge distribution focus on the other end of the continuum. Organizational learning theory is primarily people oriented; while knowledge management theory is primarily resource oriented; however intellectual capital theory and competency theory are both people and resource focused. With regard to the positioning of IS categories, it is proposed that learning and training environments and LMS tend to be people oriented, while KMS and LCMS concentrate more on knowledge resources and learning content. Organizational systems which facilitate ad hoc or informal learning vary considerably in their attention to people issues versus resource issues. Finally, the model distinguishes between IS that is used by management to manage learning within organizations; and IS that facilitate learning and that are experienced at the cold-face of everyday life in organizations.

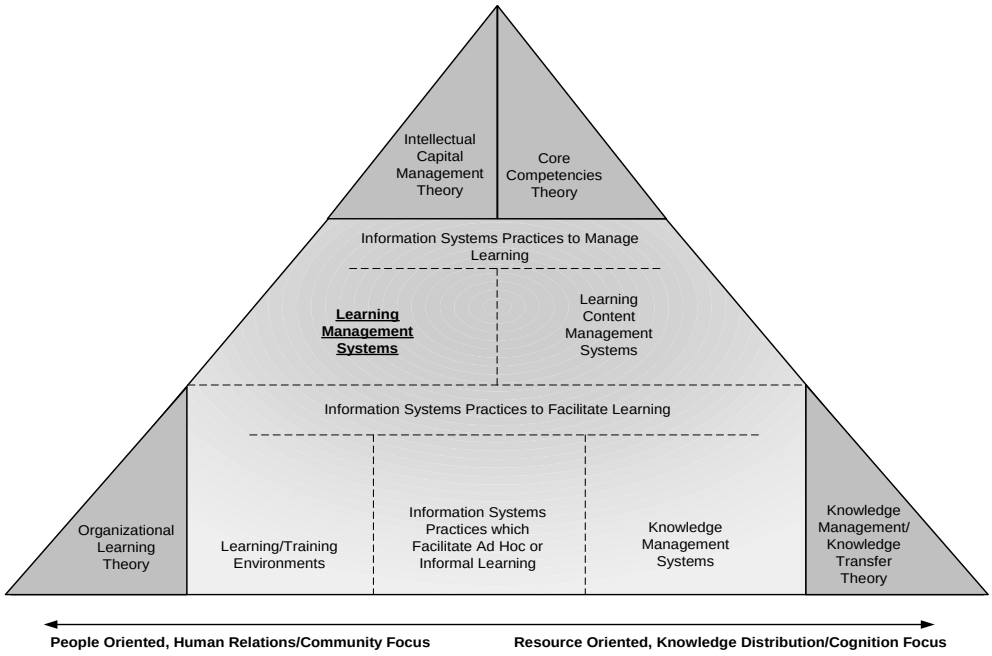

Figure 1. Putting LMS in Context: Theory & Practice in Managing and Facilitating Learning

5.2 LMS in Context: A Practice-Based Theoretical Framework

In order to further elaborate on the dimensions presented in the model shown in Figure 1, Figure 2 presents a framework which highlights the principal attributes or variables in each major element of the model and the relationships between them. The framework is based on an initial theoretical model drawn from an extensive analysis of the literature and empirical validation in a single case study of the implementation of an LMS by a major multinational enterprise. The framework illustrates that the

theories have helped influence and shape the way that IS are used to support learning. Links drawn between the theories indicate that they influence each other. The categories of IS have been segregated into two groups, namely, those that support formal managed learning within the organization, and those that support informal or unmanaged learning. The major roles are outlined for each category together with IS examples where appropriate. LMS together with LCMS and learning/training environments all contribute to the process of formal learning in an organization. On the other hand, IS which support ad hoc learning together with KMS, support informal unmanaged learning within an organization. The reason for this is that KMS, while supporting knowledge management in a formal way, only support informal learning because the learning is not delivered in a structured way, nor is it measured or validated. The IS category of LMS is highlighted within the framework to emphasize that this new type of system is central to the strategic 'people oriented' approach to managing learning that is now emerging in many organizations.

Links are drawn from one IS category to another signifying the interrelationships between them. LMS are fed directly by LCMS, as LMS remotely access learning content on LCMS. LMS have a strong two way relationship with 'learning/training environments', as training programs often initiated from within the LMS and information on the outcomes of this training is often captured directly by the LMS or indeed, manually entered into the LMS. LMS have only a tenuous link to other Information Systems that support ad hoc or informal learning. The link from these systems consists primarily of a need which they generate for formal learning and training programs. The content for this training will often stem from the IS itself, and the type of environment used will, more often than not, be decided by the nature of the system in question. KMS typically store information on problems and solutions relating to other systems that support informal learning and so there is a tenuous link between IS that supports informal or unmanaged learning and the KMS category.

The framework lists a number of key roles that an LMS can play in supporting and managing learning. These roles indicate the dimensions, factors, or variables that future researchers should try to capture when evaluating the roles of LMS. One of the more significant roles listed is that it can **support the administration of training**[3] across large organizations with a variety of training needs (see also Barron 2000, Brennan et al. 2001, Zeiberg 2001). This can have a consequential effect of **increasing the productivity of training.** From a learner's perspective, the principal role of the LMS is that it can provide a central repository for a range of learning material in a structured way which enables the system to **support a diverse body of learners within diverse learning contexts** (see also McCombs 2000, Wagner 2000, Brennan et al. 2001). This leads to the most critical role of all, which is that it can increase the use of training and hence, **increase learning in the organization.** Also from the perspective of the learner, two other significant and emerging roles of the LMS are highlighted, namely; the **provision of post learning support;** and the role of the LMS as a **signaling system for changes in the organization**, when new training is made available on the system.

LMS are also beginning to fulfil the vital role of **facilitating competence development to meet particular business objectives** (see also Hall 2001, Brennan et al. 2001). This is achieved through a dual approach to learning management (i.e. top down and bottom up). From a top down perspective, Training Managers can use the LMS to automate the 'training needs analysis' process which will assist them in the identification of training needs and will **support training planning**. From a bottom up perspective, employees are encouraged to self manage their own learning using an LMS and this has the added benefit of **encouraging accountability for learning among employees** (see also Hall 2001).

[3] Bold text within this section indicates that this is a role fulfilled by the Learning Management System.

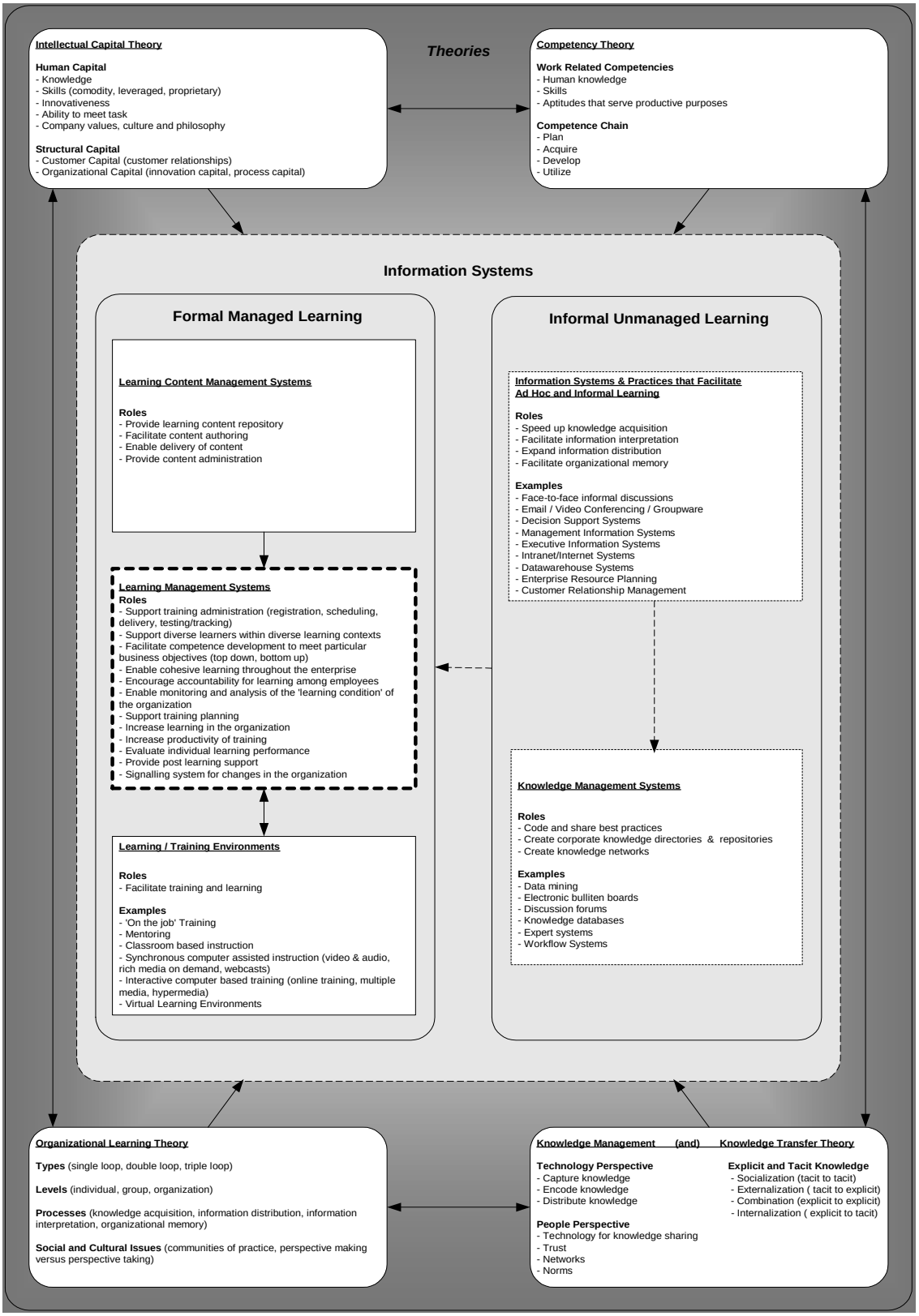

Figure 2. LMS in Context: A Practice-Based Theoretical Framework

The use of competency models for assessing and developing competencies forms the basis of a number of other key roles of the LMS which are beginning to emerge. Through standardizing role-based competency requirements and development options, an LMS can enable more consistent and **cohesive learning throughout the enterprise** (see also Greenberg 2002). Assessing employees against the standard competency model for their particular role enables the **monitoring and analysis of the 'learning condition' of an organization** (see also Nichani 2001). Furthermore, by reviewing progress between one competency assessment and the next, **evaluation of individual learning performance** for any employee is facilitated. This may then form part of the individual's overall performance evaluation.

6 CONCLUSIONS AND RESEARCH DIRECTIONS

For business enterprises such as Amazon.com, Cisco Systems, Continental Airlines, Deloitte Consulting, EDS, Ford Motor Company, General Electric, and Procter & Gamble, Learning Management Systems offer a strategic solution for planning, delivering and managing all learning events, including both online and classroom-based learning. LMS are currently playing a vital role in increasing learning within these organizations—yet this phenomenon has not received the attention of IS researchers. According to practitioners and IT vendors, the benefits of LMS are being achieved in part through enhancements to the control and management of employee competencies; nevertheless, benefits also accrue by empowering employees to be creative in managing their own learning and competency development. Furthermore, as an LMS facilitates the creation of learning structures and processes, it encourages the routinization of learning within an organization and promotes a learning culture in which formal learning and training are further integrated into everyday work practices. As indicated, practitioners and IT vendors are responsible for much of what is known about the use and role of LMS in organizations; consequently, it is an area that will increasingly attract IS researchers.
For practitioners who have not yet ventured down the road of LMS, the framework presented in this paper provides a catalogue of potential roles that an LMS may play in their organization, while those who have already implemented LMS may find the framework useful as a benchmark mechanism with which they can compare their own experiences.

The framework contributes to theory by depicting the topography of a number of key theories and IS that underpin 'learning in organizations', while incorporating the new phenomena of LMS and also identifying the principal dimensions and variables of interest by highlighting the roles that LMS play in the support and management of learning within organizations. It is hoped that this framework will deepen the IS field's understanding of the contribution of LMS to learning within organizations and will guide future research in the area. The relationships between framework elements are described at a high level of analysis; however, future theory development will expand and deepen these connections and will enable the development of testable hypotheses. Support for such an approach come from Bakos and Treacy (1986) who argue that as an area matures, there is an increasing need to move beyond frameworks toward explanatory models of the underlying phenomena. In this way, it becomes possible to build a cumulative tradition and to make normative statements to guide practice (Checkland & Holwell 1998).

Learning management methods and tools appear well suited to compensate in many ways for the deficiencies of current knowledge management techniques. Furthermore, the new crop of LCMS that are often coupled with LMS may be used to store knowledge or course components at object level (i.e. learning objects) in relational databases; and are likely to be the closest application yet to bridging knowledge management and learning management. This view is supported by Hall (2001) and Aldrich (2001); they maintain that using knowledge chunks as the building blocks for electronic learning promotes the convergence of KMS and electronic LMS, in addition to just-in-time-learning. LMS may indeed compensate for the deficiencies of current knowledge management initiatives, or at the very least, compliment them. Thus, another interesting area for future research would be to investigate the feasibility and potential advantages of merging Learning Management Systems and

practices with Knowledge Management Systems and practices, resulting in an integrated platform. Could there be an opportunity for the future development of 'Knowledge & Learning Management Systems' or 'KLMS'?

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