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# **Maximising Human Capital in Multinational Organisations: Leveraging the Power of Learning Management Systems**

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# **ABSTRACT**

*This article examines how building, integrating, and maintaining human capital with learning management systems acts as an enabler for the maximisation of human capital within multinational organisations. The article draws upon learning theory and training practices in order to demonstrate that human capital is best viewed through a competence lens. Thus, accounting for human capital should focus on matters of both individual and organisational competence. Moreover, the development of human capital should be viewed, in essence, as an exercise in competence assessment and subsequent competence development involving training and learning activities. This perspective provides an excellent starting point for increasing our understanding of how IT-based systems enable training and foster learning, thereby allowing organisations to build and maximise their human capital.*

Keywords: Human Capital, Competence Development, Organizational Learning, Learning Management Systems, LMS, Training, Learning Support

# **INTRODUCTION**

# In an intensely competitive, rapidly evolving, and increasingly knowledge-based high-tech sector, the ability to learn is critical to the success of multinational organizations. It is clear that building and maintaining a firm’s human capital through organizational learning represents a key source of competitive advantage (Campbell,Coff, and Kryscynski, 2012; Hatch and Dyer, 2004). Barney (1991), for example, illustrates that the strategic resources that underpin the success of business enterprises include an organization’s physical, human, and organizational capital.

# Physical capital includes plant and equipment, geographic location, and access to raw materials. Human capital includes the training, experience, judgment, intelligence, relationships, and insights of managers and workers. Organizational capital includes firm structure and processes, and internal and external relations, both formal and informal. However, human capital lies at the foundation of both physical and organisational capital (Nordhaug, 1994). This article argues that human capital can be enhanced through the application of IT (as physical capital) and organizational learning processes (organizational capital).

Human capital is manifested in the individual and the collective competences of social actors in an organization (Nordhaug, 1994). Over the last number of years, a strategic, human capital-oriented approach to competence development through the management of learning has been adopted by many organizations (Gonçalves Zangiski, Lima, and da Costa, 2013; Klett, 2010). This has been supported by the emergence of a new breed of information systems (IS) known as learning management systems (LMS) (Dunne and Butler, 2004; Fuller 2013; Lonn and Teasley 2009). Learning management systems are now replacing isolated and fragmented learning solutions with a systematic means of assessing and raising competency and performance levels across organizations. Practitioners and IT vendors have led the promotion and adoption of IT-based learning management solutions while empirical academic research in this area has been somewhat lacking. Therefore, an important challenge for the management and information system disciplines is to better understand LMS, as well as to examine the roles and limitations of such systems in successfully building and sustaining human capital in order to better inform practice.

This article informs both research and practice through its presentation of the findings of an in-depth case study of LMS implementation and use by a large U.S. multinational high-tech firm (CEM Corporation). As such, it provides insights into the roles that LMS can play in the continued commercial success of such organizations. The findings of this case study illustrate that learning management systems offer a strategic IS solution for planning, delivering, and managing all learning events, including both online and classroom-based learning. Practitioners recognize the need for such systems; for example, many world-class organizations are employing learning management to foster and manage learning within their organizations—such organizations include Amazon.com, Cisco Systems, Continental Airlines, Deloitte Consulting, EDS, Ford Motor Company, General Electric, and Procter & Gamble. CEM adopted the KnowledgeLink learning management system for the same reasons.

Of significance is that this article presents an inventory of roles that a learning management system plays in this organization. Also described are the practical experiences and issues encountered by CEM in their approach to building human capital using their LMS. The findings of this study indicate that, to some extent, the KnowledgeLink LMS fulfilled all of the roles suggested in the proposed conceptual framework; however, because the system was still at an early stage of use, some of the functions were found to be more highly developed than others. Furthermore, the case study identified a number of additional roles for LMS in enhancing human capital that were not suggested in the framework, but were operationalized by the KnowledgeLink technology. The article closes by offering some suggestions for future research directions and outlining the implications for practice.

# **HUMAN CAPITAL AND LEARNING MANAGEMENT SYSTEMS**

The importance of facilitating and managing learning within organizations is well accepted. Zuboff (1988), for example, argues that learning, integration, and communication are critical to leveraging employee knowledge; accordingly, she maintains that managers must switch from being drivers of people to being drivers of learning. Harvey and Denton (1999) identify several antecedents that help to explain the rise to prominence of organizational learning, namely:

* The shift in the relative importance of factors of production away from capital towards labour, particularly in the case of knowledge workers.
* The increasing 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 Human Capital Perspective on Training and Learning**

The challenge facing organizations is, therefore, to build and enhance their stock of human capital. Drawing on human capital theory (Becker, Murphy, and Tamura, 1994), and on later insights in transaction cost theory (Williamson, 1985), Nordhaug (1994)delineates how this can be achieved by illustrating howtraining and learning underpins the development of knowledge and skills, which, in addition to aptitude, shapes individual and organizational competences. Nordhaug (1994) distinguishes between the role of informal learning (i.e., part of the socialization process in organisations) and formal learning (through training, education, etc.) in competence development. He illustrates that unique organizational competences, which are highly firm specific, are a function of firm-specific intraorganisational competences, nonfirm specific industry and technical trade competences, and, ultimately, general metacompetences and standard technical competences.

Most important, however, is his assertion that human capital is best viewed through a competence lens; that is, accounting for human capital should focus on matters of individual and organizational competence, and the development of human capital is, in essence, an exercise in competence development, which involves training and learning. This, then, is this article’s point of departure in understanding how IT-based systems can enable training and foster learning, thereby building an organization’s human capital.

## **IT-Based 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 complement 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). Rowley (2001) 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 (Guptaet al., 2010), and to design systems where technology services and supports diverse learners and dissimilar learning contexts (McCombs and Liu, 2011).

In response to these needs, learning management systems (LMS) evolved; accordingly, an increasing number of firms are using such technologies in order to adopt new approaches to learning within their organizations. This new “learning management” approach has been led primarily by practitioners and IT vendors, and there is a dearth of empirical research in the area. Therefore, an important challenge for researchers and practitioners is to better understand LMS and to examine the role that these new systems play in developing and maintaining human capital in organizations.

# **RESEARCH METHOD**

This study’s primary objective is to examine how LMS may be utilized in an organizational context to facilitate and manage organizational training/learning and develop organizational competences and, ultimately, human capital. A case study approach was selected for three key reasons. Firstly, the case study research method is particularly suited to information systems (IS) research (Benbasat, Goldstein, and Mead, 1987; Myers, 1997), since the objective is the study of IS in organizations and “interest has shifted to organisational rather than technical issues” (Benbasat et al., 1987). Case research, with its emphasis on understanding empirical data in natural settings (Eisenhardt, 1989) is an appropriate method for studying IS issues and practices. Furthermore, Benbasat et al. (1987) maintain that IS researchers should learn and theorize primarily from studying systems in practice, as much IS research trails behind practitioners’ knowledge. Indeed, this is the case with respect to the availability of empirical research on LMS.

Secondly, the objective of the research is exploratory in nature ,and the single case study is considered to be a potentially rich and valuable source of data and is well suited to exploring relationships between variables in their given context, as required by exploratory research (Benbasat et al., 1987; Yin, 1994; Stake, 1994).

Thirdly, the main argument against single cases has been answered by Lee (1989). He points out that single cases differ from multiple cases only in their degree of generalizability, and in this sense the “lessons” learned from our case have been formulated as postulates, with specific view to their validity being confirmed, or otherwise, in future research. Fieldwork was undertaken over a period of 10 months, commencing approximately a year and a half after the LMS went live. A range of key informants and users of the LMS were interviewed and observed during this period, from the company’s engineering, technical training, and HR functions.

# **A CASE STUDY OF CEM’S LEARNING MANAGEMENT SYSTEM**

CEM Corporation is a global U.S.-based high-tech company with over 20,000 employees spread across several continents. CEM Corporation deployed a learning management system known as Saba Learning Enterprise™ to employees across the entire organization, as well as to CEM customers and business partners. This corporate-based system is used to deliver and track training programs and formulate learning across multiple functions within the organization, including technical functions, business functions, IT professional functions, and management functions.

The system is also used to deliver and track individual personal development training. Hosted at CEM’s corporate offices in the United States, the system is accessible through the Internet via a virtual private network and has been customized for CEM. CEM employees may sign on to the system through a CEM-specific Web application interface called KnowledgeLink. A separate Web application interface known as PowerLink provides customized access for customers and partners.

The business drivers for deploying this enterprise learning solution were:

* Decrease time-to-competency.
* Develop and manage skill sets for all employees.
* Leverage global, repeatable, and predictable curriculum.
* Integrate competency assessments to development plans.
* Accelerate the transfer of knowledge to employees, partners, and customers.
* Provide a single learning interface for all internal and external users.

Subsequent to the rollout of this system, CEM Corporation encountered tough economic conditions globally and entered a period of rationalization and cost cutting. According to the KnowledgeLink manager, “From the perspective of CEM, the new learning management system provided an opportunity to decrease its own costs by extending online learning from a primarily technical focus, to incorporate the skills and aptitudes needed throughout the organization. It presented many new possibilities including more efficient use of the existing learning centre facilities for delivery of internal courses, the maximization of learning across the organization, and improved performance though increased competencies.” He added that “all in all, it was seen as a mechanism which would enable CEM to position itself strongly as a learning-focused organization, and potentially, as an exporter of knowledge.”

## **Enterprise Learning Solution Components**

As illustrated in Figure 1, CEM’s enterprise learning solution consists of many components. Much of the learning material is created and maintained by CEM employees using a number of products including Microsoft Office, Adobe Acrobat, and Saba Publisher. Content is stored on CEM’s own storage repository, onsite. In addition, courseware that is created and maintained directly by third parties is stored offsite in the storage repository of the third-party organization. Courseware is provided to CEM by a number of third-party learning content suppliers, including KnowledgeNet and NETg. While all learning content is primarily provided to CEM employees through KnowledgeLink, it is also possible to access some of the third-party courseware directly through the Internet.

Employees may use KnowledgeLink to manage their own learning processes—for example, they may enrol in classroom courses, search for learning material, engage in an online learning activity, or look at what development options are suitable for their role within the organization. Managers may use the system to manage the learning processes of their employees—for example, they may examine the status of learning activities for their employees, assign learning initiatives to their employees, and generate reports on learning activities. Administrators and training personnel may use the system to administer and manage employee training—for example, they may publish and manage learning content, manage the catalogue of courses, and create reports on learning activities. While much of the required reporting is provided by KnowledgeLink, administrators also use third-party software called Brio to generate more sophisticated reports.

KnowledgeLink has the capability of managing and tracking both offline activities (e.g., books, “on-the-job” training, mentoring, classroom training) and online activities (e.g., video and audio, rich media, Webcasts, Web-based training, virtual classroom training). In the case of online activities, learning content may be accessed and delivered through KnowledgeLink either from CEM’s repository or from the third party’s storage repository. Certain testing is built into the learning content itself, but additional pretraining and posttraining testing may be invoked; this is provided by another third-party product called Questionmark.

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*Figure 1. CEM enterprise learning solution components*

## **Learning Management System Roles**

This section presents the findings of the case study and answers the question: “What are the roles of the learning management system in managing learning within theorganisation?” This question is addressed chiefly by reviewing the potential roles of learning management systems. The roles identified in the literature are listed as:

* Support training administration.
* Support diverse learners within diverse learning contexts.
* Facilitate competence development to meet particular business objectives.
* Enable cohesive learning throughout the enterprise.
* Encourage accountability for learning among employees.
* Enable monitoring/analysis of the status of learners within the organization.

## This part of the research will establish if KnowledgeLink fulfils these roles and if there are any additional key roles that it serves. The findings for each of the roles are presented in turn.

**Supporting Training Administration**

One of the key roles of learning management systems is to support training administration (Anderson, 2010). Many of the interviewees agreed that KnowledgeLink was primarily used by training facilitators to automate training administration and that this is still one of the more important roles of the system. The training manager within the Customer Services Organization Asia Pacific commented that “the main role of KnowledgeLink is to automate training administration tasks and then to add value.” Through the “Catalogue Management” function, trainers enter details of upcoming training classes, invite people to register for these classes online, and then subsequent to the training program, they use the system to record and track the details of the class.

The interviewees confirmed that the areas primarily supported by KnowledgeLink in the area of training administration are:

* **Training Registration:** Employees may register for a course or learning activity from many areas within KnowledgeLink including: the enrolments page, through clicking on the product title when viewing development options in the competency function, and by searching the learning catalogue.
* **Scheduling Training:** Instructor-led classes are all scheduled on KnowledgeLink. This makes visible to all potential learners the upcoming training classes they may wish to attend.
* **Delivery of Training:** KnowledgeLink is used as a central gateway to deliver electronic courses and electronic learning content.
* **Training Testing and Tracking:** While much of the prelearning and postlearning testing for both electronic learning and classroom-based learning is carried out outside of the system (either as part of the learning content itself or through the Questionmark software), the results are recorded and tracked on KnowledgeLink and may be viewed within the transcript of learning activity, maintained for each learner.

A number of the training managers interviewed spoke about the difficulties they had in getting administration rights in order to administer their own training on KnowledgeLink, though they have had administration rights for some time now. They are using these administration rights to manage learning content, manage the catalogue of learning activities, and to generate reports on training programmes and individual learning activities. One interviewee commented that “if you want to get a system out there and get people to use it, you cannot centralize the administration of it. If you have to go to someone, ask them ‘can you do this for me’ and get someone’s time, you’re just not going to use it…. The more red tape you have, the less effective it becomes.” Access rights are slowly being given to the appropriate individuals in other divisions of CEM.

**Supporting Diverse Learners within Varied Learning Contexts**

McCombs and Liu (2011) maintain that one of the biggest factors to the success of information technologies in learning is the ability to support diverse learners within diverse learning contexts. KnowledgeLink does support a large number of learners with varied roles, responsibilities, and training needs across the organization, as it supports over 17,200 across the CEM Corporation. KnowledgeLink provides access to a large central repository of varied learning material, which is organized in a structured way. As one interviewee who is a user of the system put it, “People can identify their role and cross reference KnowledgeLink for recommendations…. The system also provides guidance with paths through the training courses.” Courses supported include: technical courses, customer-service-focused courses, sales-focused courses, soft-skill or personal development courses, product courses, accountancy-based courses, and many more. KnowledgeLink was found to be able to support diverse learning contexts including: in-class instruction, training manuals or books, audio and video training, multimedia training, and virtual classroom training.

However, the HR information systems specialist stressed that KnowledgeLink may be more suitable for corporate training and standard training that can be rolled out across the organisation on an ongoing basis, rather than specialist or one-off training. She said, “Manufacturing guys use it quite a bit for their technical training programmes because the manufacturing training is generic across the manufacturing sites in CEM…. It’s the same for Customer Service.” She explained that software engineering has very much done their own thing and that they use a separate Website for training administration and tracking. This system is ISO9000 compliant and was in place before KnowledgeLink was implemented. A software engineer commented that “there doesn’t appear to be a large amount of suitable training available for software development through KnowledgeLink…. It seems to be focused at Manufacturing and Customer Services.” He added that the company’s Open Software Group produces its own training videos and disseminates these directly to software organizations throughout CEM. However, KnowledgeLink is used by the software engineering organization for training on CEM application programs and for corporate training.

**Facilitating Competence Development to Meet Particular Business Objectives**

A typical learning management system should permit competency mapping and facilitate mapping of career development paths by measuring an individual’s competency level and then guiding the learner to the most appropriate course to fill any skill gap (Brennan et al., 2001; Klett 2010; Semmann, Amrou, and Böhmann, 2012). Hall (2001) argues that when used to their full potential, learning management systems enable mapping of knowledge and competencies to specific business objectives. CEM is now beginning to facilitate competence development to meet particular business objectives through KnowledgeLink in two distinct ways. The first of these is “from the top down.” Many departments within CEM have begun to use KnowledgeLink to automate the training needs analysis process and thus centralize training planning. Previously, this was primarily a manual process whereby training managers would survey employees within a department in relation to their skills and abilities. They would then collate the results on an Excel spreadsheet and draft training plans that attempted to address the main training needs of that department. Through KnowledgeLink, competencies are assessed using role-based competency models, and thus trainers can identify all training needs for each job role type. Subsequently, they can develop training plans to meet those needs.

From a management perspective, it is possible for a manager to get an overall picture of the competency levels within their department that will help them to identify competency deficiencies or, indeed, competency overlaps. Furthermore, a manager will be able to see how competency levels within their department compare with those of similar departments elsewhere within CEM. The service support manager of EMEA pointed out that “although it started as just automation of training needs analysis, managers then saw that they can get a picture of training gaps and average competency levels worldwide…. They can also see overlaps in competencies.”

The second manner in which CEM is beginning to facilitate competence development to meet particular business objectives is “from the bottom up.” KnowledgeLink facilitates a competency assessment process which enables an employee to identify gaps or shortfalls in their competency levels with respect to the competency model associated with their own specific job role. As outlined earlier, learners may select development options that will help develop deficient competencies, and subject to the passive approval of their manager, the learner can carry out the necessary learning activity to acquire the competence. These development plans may also specify prerequisite training or knowledge, thus facilitating a certain amount of control over the order and structure of training.

The competency model for product software engineers (PSEs) within Global Technical Support, EMEA, contains 165 competency assessment questions—which examine competency levels within 29 competency categories (questions on each category are not grouped together and are dispersed throughout the questionnaire)—and also contains a free text area for additional information. This model was created by the training manager within Global Technical Support, EMEA, in consultation with a number of individual PSEs. The model assesses both technical skills (65%) and soft skills (35%) and takes approximately 25 minutes to complete. Competency levels range from between “competence level 1” and “competence level 5.”

While competency models already exist on KnowledgeLink for many roles, standard competency models do not yet exist for all role types. Training managers in each area are currently working through a process of drawing up a standard competency model for each role type by collaborating with groups of employees who hold that particular role type. The KnowledgeLink manager pointed out that many roles (particularly senior roles such as manager, supervisor, and team lead) have generally standard competencies, and that devising competency models for these roles is straightforward because they can be benchmarked against similar roles in the industry. However, he emphasised that “as you drill down, you find that there are a lot of specialist functional competencies and you get into the ROI question. Because there is such a large investment in time and effort involved in devising competency models for all technical roles, it has to be driven by the local business needs.”

It was emphasized by the KnowledgeLink manager that although competency models facilitate the specification of certain skills that are needed to fulfil a particular job role, there are some limitations to this approach. One limitation was stated as “the difficulty in having accurate competency models for all roles when there is such a vast array of diverse technical positions.” This was reiterated by two other interviewees, who explained that a particular group of employees in their department held only a small number of common competencies, yet they had a lot of specialist skills. One interviewee asked, “Do you have a separate competency assessment for each specialist skill, or do you have a competency assessment model with 500 questions in it?...If you do, people will strike ‘not applicable’ to it.” Furthermore, this interviewee highlighted the difficulty in measuring the same competencies across two areas that have a different emphasis on depth, versus breadth, of knowledge. For example, one area where depth of product knowledge is critical is in “technical problem solving for a particular CEM product,” yet another area like “technical problem solving for general customer queries” may require a greater breadth of knowledge on various products, but may not require a profound knowledge in any one product area.

Another limitation of the competency models highlighted by a number of interviewees related to when these models are used for the purposes of a performance review. The apportioning of a weighting of 25% to the learner and a weighting of 75% to the manager/mentor was questioned, as it may be inappropriately geared in favour of the manager/mentor. This may cause difficulties if the manager/mentor is not entirely familiar with all of the competencies assessed or if the manager/mentor is not fully aware of the learner’s abilities in each of these areas. The KnowledgeLink manager argued that “performance assessment must be a joint agreement, which has the buy-in and support of the assessee. They must both jointly generate a development plan which uses the KnowledgeLink competency models, but also incorporates suggestions from both the assessor and the assessee.” Another interviewee pointed out that the ideal scenario in allowing an employee to develop and grow involved a two-pronged approach. He stressed that “one approach should be geared towards a training plan that enables the employee to do their job properly, and the other approach should be geared towards the career development of the individual by helping him/her to establish what training they would need in order to develop their own career ambitions.”

In sum, the research findings illustrate that KnowledgeLink is beginning to fulfil the role of facilitating competence development to meet particular business objectives. This is being achieved through both a top-down approach and a bottom-up approach to learning management. From a top-down perspective, training managers within CEM are beginning to use KnowledgeLink 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, CEM is encouraging employees to self-manage their own learning using KnowledgeLink. They may carry out competency assessments against the standard competency model related to their own particular role, and subsequently they may review learning options available and devise development plans to acquire the competencies in which they are deficient. Finally, although role-based competency models have been set up on KnowledgeLink for many of the customer-facing roles, CEM is still in the early stages of constructing workable competency models for all job roles within the organization.

**Enabling Cohesive Learning throughout the Enterprise**

Cardona, Velez, and Tobon (2013) maintain that learning management systems replace isolated and fragmented learning programs with a systematic means of assessing and raising competency and performance levels throughout the organization. This study illustrates that learning plans for individuals are not coordinated in sync with any overall learning plan, but are aimed to meet particular role competencies and are either self-directed or are controlled by the manager of the individual. From this perspective, KnowledgeLink facilitates consistency and cohesion by allowing standardized competency models to be defined and by enabling development plans to be constructed in order to achieve the competencies outlined in the competency model. Furthermore, although curricula are not yet provided for all roles, some curricula or training maps are provided on the system for key technical, sales, and customer service roles, and these may be used to guide the sequencing of developmental plans. The KnowledgeLink manager stated that “although KnowledgeLink does not provide a learning development plan for the entire organization…. It can, however, provide status reports on all competency levels, and these may be analysed manually in order to establish an overall learning development plan.”

**Encouraging Accountability for Learning among Employees**

Learning management systems also increase employee and manager accountability for learning and performance results (Hall, 2001). It was found that KnowledgeLink has the capability to be very “learner focused” and to be strong in encouraging accountability for learning among employees and managers. The KnowledgeLink manager pointed out that “self-assessment is facilitated and self-directed learning is offered, which has passive approval.”

The training manager of Customer Services in Asia Pacific stated that “the development of an individual may be guided by a number of factors, including: corporate compliance requirements, competencies required to fulfil a particular role, and self-assessment carried out by the individual themselves.” However, it was stressed by the KnowledgeLink manager that “at the end of the day, the onus is back on the employees to develop themselves.” It was also generally agreed among the respondents in this study that this depends to a large extent on the level of motivation of the individual. It was found that the process of self-planning of career development has for the most part not been taken up as yet within the organization. A number of potential reasons for this were discovered and are outlined below.

One interviewee highlighted that “many employees may still feel that the system is primarily designed for course registration, and the other elements of the system may need to be emphasized more internally.” He was also of the opinion that CEM may not be entirely effective in promoting and marketing the downloadable learning material that is on KnowledgeLink. This was supported by his observation that “if people venture in there and snoop around, they’ll find some good stuff, but they’ll stumble across it…. But it won’t be presented to them to say that this is now available on KnowledgeLink.” Furthermore, another interviewee pointed out that notification about upcoming training courses is currently emailed to managers, but not to employees. This interviewee pointed out that “some courses like new product training or Web-based training may get missed.”

It was claimed by one interviewee that “although the initial rollout of KnowledgeLink seems to have been good and although there is a growing awareness of the system, people still have not [come] to grips with using it…. We should possibly promote it more internally and formalize its use within the review process.” Another interviewee argued that “some employees may fear that if they use the system to log their competencies, their career may be negatively affected.”

It was found that the mobilization of KnowledgeLink may lack the support and buy-in of senior management. Within CEM the initiative is being driven by a number of key training managers. They have been running a number of pilot projects which aim to get buy-in from employees to engage with the competency assessment process, and following on from this, they hope to get more support from senior management and directors within the organization. Ensuring that adequate training and learning takes place in the organisation is part of the remit of the human resource directors, but this is only one of their many demanding priorities. Therefore, no one director at CEM is primarily focused on training and learning, and no one director has the objective of maximizing learning using KnowledgeLink.

One cultural difficulty outlined by one of the interviewees was that “some supervisors may object to individuals on their team engaging with KnowledgeLink and seeking additional training for themselves.” He had seen this happen in the organization and maintained that these supervisors may have felt that it would upset the status quo of their team, in which all members tend to have a similar set of skills and competencies.

Finally, one interviewee stated that “there has been some discussion about running an organizational-wide regrading program that requires everyone to sign onto the system within a specified timescale and to carry out a self-assessment.” The key difficulty with this is that competency models for all role types would have to be in place prior to the running of the program. A more realistic scenario is that competency models will be done “piecemeal” throughout the organisation, and employees will, over time, be migrated onto KnowledgeLink for the management of their own competencies, though there is no structured plan or roadmap in place to guide this migration process.

**Enabling the Monitoring and Analysis of the Status of Learners**

Learning management systems can help administrators and management to target, deliver, track, analyse, and report on their employees’ learning status within the organization (Weinbrenneret al., 2010). The KnowledgeLink manager explained that “the status of competencies within the organization may be reported by KnowledgeLink at a number of different levels.” Status of competencies may be reported at an individual level, project team level, section level within a department, and department level. This report may be time based or may specify all competencies that have been acquired by those employees. While status of competencies is not reported at the organizational level, the usefulness of such a report was questioned by a number of interviewees, because this would contain large numbers of diverse and unrelated competencies within a large organization such as CEM. The KnowledgeLink manager also argued that “through the competency assessment process, KnowledgeLink can support a manager in assessing an employee’s role-based competencies…and having agreed development plans with that employee, a subsequent competency assessment can help that manager to determine the employee’s ‘learning performance’ in acquiring the new competencies, as per the development plan.” He added that “this ‘learning performance’ may then form part of the overall performance review for the employee.”

CEM also has a database called SkillsCentre, which contains a skills inventory matrix for everybody in the organization. This database is updated regularly by each employee. Currently, there are no links between KnowledgeLink and SkillsCentre. One interviewee raised the concern that this database may not be widely used because it may be “at a level of granularity that is not useful.” Another issue raised and potential source of confusion was that the ratings for skills on SkillsCentre range between level 0 and level 4, whereas the ratings for skills on the KnowledgeLink system range between level 1 and level 5.

## **Additional Key Roles and Attributes of the LMS**

A number of other key roles of KnowledgeLink were identified by participants of the research study. It was the view of a number of the interviewees that KnowledgeLink increases training productivity. As one training manager put it, “With KnowledgeLink, the volume of work that you can get through is greater…. It improves the efficiency of delivering and managing training.”

Because KnowledgeLink contains a central repository containing details of all available training within the organization in a structured way, it emerged during the interviews that KnowledgeLink has helped to improve the profile of the training organization and has also stimulated an increase in the use of training within CEM. One manager argued that “KnowledgeLink has really improved the profile of the training organisation…before it was known that the training organisation facilitated training, but you couldn’t put your finger on something…. Now there is a central repository and you can see all the training that is being delivered.”

The KnowledgeLink manager highlighted that another key role of KnowledgeLink is the provision of postlearning support. He outlined that “although this function is not yet extensively used, KnowledgeLink enables employees to access their transcript, and through this transcript they may rerun material from a course or download documents associated with it.” A less obvious role of KnowledgeLink was outlined by an interviewee who carries out a technical role within CEM. He maintained that “KnowledgeLink acts as a flagging mechanism for the changing nature of CEM’s own products because when new training becomes available on KnowledgeLink, this normally signals either that new product features have been released or that product changes have taken place.”

# **CONCLUSION**

The deployment of CEM’s learning management system has enabled the corporation to address many of the challenges that it faced prior to the system’s implementation. For example, the company now has a single enterprise learning solution that supports the administration of all training across the entire organization. From the point of view of the employees, the system provides a centralized mechanism which enables them to search for and to enrol in selected courses or training programs; it also offers guidance on recommended training paths and curriculums. Furthermore, the competency assessment facility enables employees to determine and rectify competency gaps, as well as provides management at CEM with a means of monitoring and managing overall employee competency levels within the organization.

The LMS solution also supports all training content, whatever its subject matter or form, and enables the management and control of access to this content using one system. This has the added advantage of highlighting duplication of training material in different parts of the organization and paves the way for streamlining the efforts of different training services within the company. The flexibility and dynamic nature of the system allows CEM Corporation to unilaterally introduce and to quickly implement new training requirements across the organisation in response to changing business needs or new technical advances. The LMS may help to attract or retain key personnel by offering them a unique opportunity to monitor and develop their competencies and to manage their careers within the organization.

As indicated, CEM Corporation is a high-tech organization that operates in a very competitive and dynamic business environment. Managing learning and measuring learning outcomes are in themselves difficult tasks, but they are made even more problematic within complex technical and engineering learning domains, such as those that exist at CEM. It is unlikely that the LMS will enable the full management of all of the learning and develop the organization’s human capital in a “truly scientific way” (cf. Nordhaug, 1994), though it will assist greatly in managing the diverse and extensive array of learning contexts and learning processes that must be supported. The system’s strengths lie in the new approach and attitude that it will encourage and inspire in the hearts and minds of individuals within the organization, as it enables training, learning, and competence development that is highly visible, structured, and more accessible within the organization. This is achieved by improving the control and management of employee competency levels, and also by empowering employees to be creative in managing their own learning and competency development.

One key challenge for management at CEM is to increase their influence and control over training and learning within the organization, while at the same time increasing employee commitment to managing their ongoing self-development by taking responsibility for improving their knowledge of the business, and building unique and intraorganisational competences, as per Nordhaug (1994). It is clear that these objectives are delicately balanced and must therefore be handled carefully. Too much control may de-motivate employees and discourage them from engaging with the system, but at the same time, enough control must be exerted to ensure that employees are developing competencies that support the day-to-day operational requirements of the organization, as well as being in sync with the overall goals and objectives of the company.

Another important consideration facing CEM Corporation is that it has a long way to go before all of the benefits offered by their LMS can be fully exploited. Not all formal training is being tracked and managed through the LMS, and some departments independently organize their own training outside of the system. One engineer argued that “there doesn’t appear to be a large amount of suitable training available for our department.”The benefits offered by this enterprise learning solution will not be fully realized until sufficient training or learning programs are offered to all employees in all departments across the organization. While it is possible to take certain online training directly through the Internet, it is not possible to track or manage associated learning outcomes, as this training is initiated and completed outside of the LMS, and is not currently recorded by it. It is understandable that it will take some time to incorporate every training program for all employees onto the system, but it is critical that this is achieved as quickly and efficiently as possible, to ensure support for the system and ongoing use of the system across the entire organisation.

In addition, role-based competency models have not yet been drawn up for all roles within the organisation. Competency assessments are instrumental to determining if positive learning outcomes have been achieved, and they will also demonstrate if the organization is obtaining a return on its investment in implementing and deploying the LMS. Competency assessments offer management at CEM the opportunity to identify and rectify gaps or overlaps in competency levels, as well as provide a means of assessing and managing overall competency levels within the organisation. Even where competency models are available, the study revealed that the process of self-management of career development has, for the most part, not yet been taken up within the organisation. Moreover, some employees, and indeed managers, have not yet engaged with the competency assessment process. A structured plan or roadmap is required that is formulated in conjunction with local business needs to enable the formal migration of all employees onto the system for ongoing competency assessment and competency development planning using the LMS. In this way, the LMS may be employed to allow a dual focus on both individual and organisational competence assessment/development. This would facilitate the ongoing maximisation of human capital through training and learning activities.

# **REFERENCES**

# Anderson, C. (2010). Economic impact on training investments. *Chief Learning Officer,* (Nov.), 52-54.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120.

Becker, G. S., Murphy, K. M., & Tamura, R. (1994). Human capital, fertility, and economic growth. In G. S. Becker (Ed.), *Human capital—A theoretical and empirical analysis, with special reference to education* (pp. 323-350). Chicago: The University of Chicago Press.

Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly,* *11*(3), 369-386.

# Brennan et al. 2001.

# Campbell, B. A., Coff, R., & Kryscynski, D. (2012). Rethinking sustained competitive advantage from human capital. *Academy of Management Review,* *37*(3), 376-395.

# Cardona, S., Velez, J., & Tobon, S. (2013). Towards an adaptive system based on competences. In *Proceedings of 2013 IEEE Colombian Conference on Communications and Computing (COLCOM)* (pp. 1-6). New York: IEEE.

Dunne, A., & Butler, T. (2004). Learning management systems: A new opportunity. In *IT Innovation for Adaptability and Competitiveness: IFIP TC8/WG8.6 Seventh Working Conference* (pp. 419-440). New York: Kluwer Academic Publishers.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review,* *14*(4), 532-550.

# Fuller, T. F. (2013). Beyond training: The impact of learning management systems (LMS) on employee turnover. In *Proceedings of the Fourth International Conference on E-Learning* (pp. 26-37). New Castle, DE: Society of Digital Information and Wireless Communications.

# Gonçalves Zangiski, M. A. d. S., de Lima, E. P., & da Costa, S. E. G. (2013). Organizational competence building and development: Contributions to operations management. *International Journal of Production Economics,* (144), 76-89.

# Gupta, J., Termeer, C., Klostermann, J., Meijerink, S., van den Brink, M., Jong, P., Nooteboom, S., & Bergsma, E. (2010). The adaptive capacity wheel: A method to assess the inherent characteristics of institutions to enable the adaptive capacity of society. *Environmental Science & Policy,* *13*(6), 459-471.

Hall, B. (2001). *Learning management systems 2001*. Sunnyvale, CA: Brandon-Hall.

Harvey, C., & Denton, J. (1999). To come of age: Antecedents of organizational learning. *Journal of Management Studies, 37*(7), 897-918.

# Hatch, N. W., & Dyer, J. H. (2004). Human capital and learning as a source of sustainable competitive advantage. *Strategic Management Journal,* *25*(12), 1155-1178.

# Klett, F. (2010). The design of a sustainable competency-based human resources management: A holistic approach. *Knowledge Management & E-Learning: An International Journal, 2*(3), 278-292.

# Lee. 1989.

# Lonn, S., & Teasley, S. D. (2009). Saving time or innovating practice: Investigating perceptions and uses of learning management systems. *Computers & Education,* *53*(3), 686-694.

# McCombs, S., & Liu, Y. (2011). Channeling the channel: Can iPad meet the needs of today’s m-learner. In *Proceedings of the Society for Information Technology & Teacher Education International Conference* (pp. 522-526). Chesapeake, VA: AACE.

Myers, M. D. (1997). Qualitative research on information systems. *MIS Quarterly, 21*(2), 221-242.

Nordhaug, O. (1994). *Human capital in organisations: Competence, training and learning*. New York: Oxford University Press.

Rowley, J. (2001). Knowledge management in pursuit of learning: The learning with knowledge cycle. *Journal of Information Science, 27*(4), 227-237.

# Semmann, M., Amrou, S., & Böhmann, T. (2012). Analysis of learning management systems according to a holistic view on corporate education services. In *Proceedings of SIGSVC Pre-ICIS Workshop* (vol. XX, pp. XX-XX)*.* CITY: PUBLISHER.

Stake, R. E. (1994). Case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. XX)*.* Thousand Oaks, CA: Sage Publications.

# Weinbrenner, S., Hoppe, H. U., Leal, L., Montenegro, M., Vargas, W., & Maldonado, L. (2010). Supporting cognitive competence development in virtual classrooms—personal learning management and evaluation using pedagogical agents. In *Proceedings of the Tenth International Conference on Advanced Learning Technologies* (pp. 573-577). New York: IEEE.

Williamson, O. E. (1985). *The economic institutions of capitalism*. New York: The Free Press.

Yin, R. K. (1994). *Case study research, design and methods* (2nd Ed.). Newbury Park, CA: Sage Publications.

Zuboff, S. (1988). *In the age of the smart machine: The future of work and power.* New York: Basic Books.