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Analysis of Learning Management Systems According to a Holistic View on Corporate Education Services

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Analysis of Learning Management Systems According to a Holistic View on Corporate Education Services

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Abstract
According to the still growing importance of services and especially knowledge-based services the importance of lifelong learning increases, too. In these premises the European Union targeted a rate of workforce participating in lifelong learning to at least 15 %, the current value is 9,3 %. The main impulse for current participants in an ongoing learning process is to improve career opportunities and to perform better in their jobs. Keeping these changes in mind, corporate education services are a good example of knowledge-based services. First of all, these services integrate the customer in depth to identify their specific needs and to deliver the service. Therefore, they can be seen as a good example of services following a service-dominant logic. Secondly, this sector gains on importance due to the economic as well as the demographic changes. Thirdly, corporate education services bear potential for economic growth. In 2008 market had a volume of 26,5 billion Euro in Germany. With the aspired increase in lifelong learning there is still potential to increase this number. Therefore this paper examines the potentials of current learning management systems to support corporate education services from a holistic perspective based on Kirkpatricks Four-Level Model. Based on this analysis potentials for further improvements of the support of the learning process are derived.

Keywords: service service productivity corporate education learning management system

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INTRODUCTION

According to the still growing relevance of services and especially knowledge-based services, the importance of lifelong learning increases. Under this circumstance the European Union targeted a raise of the rate of workforce participating in lifelong learning from currently 9,3% to at least 15 % (Eurostat 2011). The main impulse for current participants in an ongoing learning process is to improve career opportunities and to perform better in their jobs.

Keeping these changes in mind, corporate education services are a good example of knowledge-based services (Vargo and Lusch 2004). First of all, these services integrate the customer in depth to identify their specific needs and to deliver the service. Therefore, they can be seen as a good example of services following a service-dominant logic, especially the co-creation is extensively considered (Vargo and Lusch 2004). Secondly, this sector gains on importance due to the economic as well as the demographic changes (Eurostat 2011). Thirdly, corporate education services bear potential for economic growth. In 2008 market had a volume of 26,5 billion € in Germany (Pfeiffer and Kaiser 2008). With the aspired increase in lifelong learning there is still potential to increase this number. To deal with this prospected growth it is necessary to enhance the productivity of corporate education services, because i.e. potential improvements of service quality are currently not exhausted (Gabriel et al. 2007). Especially the role of IS in this context is not clear. This leads to the following research question: *What is the influence of learning management systems on service productivity?*

To answer this question we introduce in the following section the theoretical foundations in the next chapter. After that, we analyze the state-of-the-art of learning management systems and show which function they have. As a next step we analyse the possibilities recent learning management systems provide to support a holistic von on corporate education, based on requirements derived from Kirkpatrick´s Four-Level Model (Kirkpatrick 1966). This mapping leads to a deep understanding of the possibilities to utilize current learning management systems and shows which aspects of the delivery of corporate education services are not addressed. Based on these findings we show how the quality of corporate education services can be increased by extending learning management systems. Finally we draw a conclusion and give an outlook on further research.

THEORETICAL FOUNDATIONS

Productivity of Services

Traditionally productivity is a measure related to the utilization of input resources in a transformation process to create a product (Vargo and Lusch 2004). In the case of services this measure describes the same relation with a value as output, which is created in cooperation with the customer (Grönroos and Ojasalo 2004; Parasuraman 2010). In spite of the high relevance of productivity improvements in the service sector, there is currently no accepted understanding of service productivity (Baumgärtner and Bienzeisler 2006).

Therefore, following a goods-dominant logic productivity concepts assume that an increased productivity can be achieved by minimizing the inputs with constant outputs and a given quality. These concepts are not applicable to services, because on the one hand, the definition of a single service unit is not trivial and on the other hand, the assumption of a given quality is not applicable for services, because a variation of input factors leads to a changed perceived quality for the customer (Grönroos and Ojasalo 2004). To face these shortcomings Grönroos and Ojasalo (2004) suggest a service productivity model based on three types of efficiency:

1. Internal efficiency: Describes the efficiency of the transformation of inputs to outputs, resulting in services.
2. External efficiency: Describes the perceived quality of the service.
3. Capacity efficiency: Describes the efficiency of the utilization of the service provider´s capacity.

In the remainder of this paper we understand service productivity analogously to Grönroos and Ojasalo (2004).

Corporate Education Services

Education relates to the process of learning and acquiring information. In every country an individual has various educational opportunities. The German education service landscape for adults consists mainly of private education service providers and public universities. The wbmonitor survey has captured an overview of the types of providers in the German education service landscape (Ambos et al. 2010). As in previous years, nearly half of the participants of the survey are private facilities (33% commercial, 15% common good), 14% are community education center. Corporate and business-oriented institutions as well as large social organizations represent 12% each. Ten percent are allocated to vocational colleges and specialized universities and five percent to other types of providers. The deviations from 2009 do not exceed more than two percentage points. (Ambos et al. 2010)

Corporate education services can be characterized by a high degree of interactivity and, consequently, individuality. Finally, learning is an active process that stringently requires interpersonal interaction (Alaviet al. 2002). Corporate education service providers offer occupational training and further education services. In Germany, the market for these services has an estimated volume of 26.5 billion € (Pfeiffer and Kaiser 2008). In 2005, 69% of German companies offered education services (Destatis 2007).

Given demographic change, the development of the knowledge society and the rise of new technologies, demands on corporate education are likely to increase. The very same circumstances, however, require a change in how these services are designed and delivered to make the best use of increasingly limited qualified human resources in a quintessential people-based service. According to this, education services have a high growth potential and at the same time there is still need for research (Pfeiffer and Kaiser 2009).

To describe and evaluate corporate education services Kirkpatrick introduced a Four-Level Model, which is still accepted und utilized by scholars as well as in practice (Kirkpatrick 1996; Salas and Cannon-Bowers 2001; Van Buren and Erskine 2002). This model can be used to control the effect of corporate education services. This is done on the following four levels (Kirkpatrick 1996):

1. Reaction: On this level the focus is on the participant and their subjective valuation of the service. Aspects that should be considered on this level are the satisfaction with the trainer, the content of the service, the use of media and the infrastructure in terms of i.e. learning facilities and social program.
2. Learning: This level is utilized to measure the success of the corporate education service. It can be done by addressing the acquisition of knowledge, the improvement of skills, and changes in the attitude of the participants.
3. Behavior: Changes in the participant’s behavior on their jobs are considered on this level. This means the transfer of the acquired knowledge towards real-life situations in the corporate environment. Therefore this level is the first where the assigning

customer – the corporation – can benefit in terms of business value from the education service, because i.e. the customers customer can be better supported or new job profiles can be staffed with trained employees.

4. Results: This level represents indirect effects on the customer's business value. This could include higher sales, increased productivity, and reduced costs.

Based on these four levels requirements for the support of each of them can be derived to identify aspects that have to be addressed by any kind of supporting information systems. These are alike to the high level of abstraction Kirkpatrick used also abstract and the operationalization of these can differ according to the analyzed information system. The derived requirements are shown in table 1.

	Requirements
Reaction (L1)	a. Providing learning materials b. Supporting communication of the participants c. Providing accommodation and other prevailing circumstances
Learning (L2)	a. Supporting the learning process
Behavior (L3)	a. Supporting the transfer of knowledge to the job
Result (L4)	a. Aligning the educational service with its intended goals

Table 1. Requirements of the Four-Level Model (based on Wang and Wang 2005)

Co-Creation

According to the relevance of a deep integration of the customer in corporate education services it is necessary to introduce the concept of co-creation as a mayor part of the service dominant logic (Vargo and Lusch 2006).

During the last decades the perspective of value creation turned dramatically from a value-in-exchange view where value for customers is embedded in products to a value-in-use view where value for customers is generated during the value-generating processes can be identified (Grönroos 2008). This shows the new understanding of value as a result of a creation process of a service provider together with the customer (Vargo and Lusch 2006). This change in perspective is characterized by Vargo and Lusch (2011; 2012) with four core premises. One of them is the integration of the customer in the service. In this paper we focus on this aspect of the service-dominant logic as one of it´s major shifts that is especially relevant for corporate education services that are customer-centric.

Following this shift value is not created by purchasing a product but by using it in a specific context (Gustafsson et al. 2011). This reflects renunciation from distinct roles of customers and producers towards a broad engagement of the customer in value creation as it is typical in the education service domain (Prahalad and Ramaswamy 2004).

This new perspective emphasizes on the understanding of the customer as substantial part of the value-creation (Edvardsson et al. 2010; Spohrer et al. 2008). From this perspective the customer is able to tailor the product or service pursuant to their needs, which results in an enhanced perceived value (Kristensson et al. 2008). Furthermore it leads to a closer relationship

between the customer and the service provider, because the customer is committed through the complete process of value creation (Jaworski and Kohli 2006; Babb and Keith 2011). This also implies that the customer can be part of the value creation along the value creating activities e.g. by providing customer-specific knowledge to a service (Gustafsson et al. 2011). Another aspect of co-creation is that customers are expected to be more satisfied with the services, since they actively participate in the value creation (Randall et al. 2011). In the domain of corporate education services the involvement of the customer, understood as the participant as well as the contracting entity, is high, because the service is tailored towards the specific needs of the corporation. This deep integration is necessary to ensure that the service meets the level of knowledge of the participants as well as the specific needs of the customer. Such highly customized services can only be developed if the customer is part of the development processes and shares his knowledge and resources with the service provider. Furthermore, co-creation can be seen during the delivery of the service because it is influenced by the participants' behavior and the dynamics between the members of the group.

METHODOLOGY

To understand the impact of learning management systems on the productivity of corporate education services it is necessary to identify how each function of the system influences the learning process. This is done by an analysis of current literature, scholarly as well as practitioner-driven, on learning management services and their functions. In a second step we compared these functions with requirements derived from Kirkpatrick´s Four-Level Model. Using this model ensures a holistic view on corporate education services, which includes productivity-relevant aspects that could not be addressed by an analysis of the service delivery based processes. After this analysis it is possible to identify shortcomings of current learning management systems, which bear productivity improvements.

LEARNING MANAGEMENT SYSTEMS AND THE FULFILLMENT OF KIRKPATRICK´S FOUR-LEVEL MODEL

Traditional approaches to education services, where the knowledge is usually achieved through presence lessons, has shortcomings, because participants are not motivated enough to consume knowledge actively (Bates 2000). Information and communication technology gives the opportunity to increase the motivation of the participants of educational services (McCormack and Jones 1997). The use of information and communication technology for educational services is called e-learning and according to the European Commission defined as: "the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration" (European Commission 2001). Because of still notable high retention and high dropout rate in online educational services, e-learning nowadays orientates more on communication, collaboration and interactivity face-to-face (Hoic-Bozic et al. 2009). Blended learning combines the advantages of e-learning and the approach of traditional education services, though different learning methods to promote better learning effects (Junxia and Fengli 2007). Different terms are used to describe a system for e-learning and blended learning scenarios such as interactive management, virtual learning environment, content management system, learning content management system and learning management system. Learning management systems has become a default as e-learning and blended learning have been adopted widely (McCormack and Jones 1997).

As specialized Learning Technology Systems, learning management systems are based on contemporary Internet and Web technologies (IEEE 2001). Furthermore, learning management systems implement the open and distance paradigm to provide educational services (Carlson 1998). The learning management system is used to provide a way for enhancing the content and course integration problem of an education service (Rößling et al. 2008). Lectures and participant of educational services are supported by learning management systems, fundamentally with tools and functions like course and learning object management, asynchronous and synchronous group communication, asessment collection and grading, and education service evaluation (Ceraulo 2005). To give lectures the opportunity to create e-learning material efficiently, learning content management systems focuses on creating learning objects that are used within learning management systems. Lectures can solve the problem of creating learning objects just in time for individual education service participants with their special needs. (Greenberg 2002). State of the art learning management systems are developed in-house or externally and provide the tools and functions as a service to different users within or across national borders (Beck 2005). Learning management systems are provided throughout a commercial company or as open source software. Professional companies develop commercial Systems with standard development methods, the system is tested for bugs, upgrades can be automatically installed, and a possible customization of the system is done by the company itself (Aberdour 2007). Open-source systems overcome most of the disadvantages of the commercial systems, they protect the organization from being bounded to a company and the comstomizaition is much more easier (Kljun et al. 2007). This indicates that if a education service provider need a flexible customizable learning management system, it should come from the open source area.

Brandon Hall (2000, 2005) summarized a more in depth learning management system capability overview. Based on this initial research as well as on the derived requirements on learning by Kirkpatrick, in the following, the requirements are mapped on the capabilities of learn management systems. This is depicted in Table 2.

	Requirements according to Kirkpatrick
Manages e-learning	L1 a
Management of classroom, instructor-led (ITL) training	L1 a, b, c; L2 a
Performance reporting of training results	L4 a
Learner collaboration	L1 b; L2 a
Keeping learner profile data	L1 a, L4 a
Sharing learner data with an ERP system	L4 a
Competency mapping - skill gap analysis	L4 a
Creates test questions and test administration	L2 a
Management of learning programs and planning (Event scheduling)	L1 c; L2 a

Table 2. Mapping of learning requirements with typical functions of learning management system

Manages e-learning: According to the mapping shown in Table 2., e-learning respectively learning objects like documents, podcasts, videos, wikis, assessments, (social) bookmarks or rss feeds, etc. can be managed by learning management systems within a learning process, and thus it fullfils the provision of learning materials (L1 a).

Management of classroom, instructor-led (ITL) training: Fourthermore, through the management of classrooms, rooms within and beyond the facilities of a service education provider can be managed, this fulfills the requirement of provision of accommodation and other prevailing circumstances (L1 c). In case of instructor-led training the managed rooms can be virtually, utilising video-conferencing rooms, where learning objects can be provided for the education service participants, the participants can get support by collaboration tools and furthermore support for there learning process (L1 a, b; L2 a).

Performance reporting of training results: As a learning management system can be used to report training results to other instances, the customer can receive information about the performance of the education service participant. Therefore, the customer can align the educational service with its intended goals with the given data and information. (L4 a)

Learner collaboration: Learners can collaborate through social networking, forums, blogs, chats, screencasts, etc. to support communication of the education service participants and therefore a learning management system supports the learning process of participants. (L2 a)

Keeping learner profile data: By means of learning management systems learner profile data or any information about the education service participant can be kept, lecturers or participants can comprehend given or used learning objects, thus the requirement of provision of learning materials is fulfilled (L1 a).

Sharing learner data with an ERP system: Through sharing learner data with an ERP system, other instances like the employer or education service provider can comprehend learner data and with the data align the educational service with its intended goals (L4 a).

Competency mapping - skill gap analysis: Furthermore, the alignment of the educational service with its intended goals can be done by competency mapping, e.g. by a skill gap analysis. The gap shows the customer further needs of education services or the results of a present education service (L4 a)

Creates test questions and test administration: Created test questions can support the learning process by connecting them by event scheduling in a timeline with given education service events. (L2 a) Furthermore, the results of the tests support indirectly the alignment of the educational service with its intended goals.

Management of learning programs and planning (Event scheduling): By managing the learning programs and by planning (event scheduling) the education service, events connected to learning objects and facilities of education services can be organized. (L1 c) Once the program is planned arranged learning objects and facilities within a timeline supports the education service participant within the learning process. (L2 a)

The analysis shows that current learning management systems fulfil all requirements concerning reaction and learning. Furthermore, participant-based requirements on the result level are fulfilled, too, but this is just a minor aspect of this level. Measures according to business values are not supported by current learning management systems. Moreover, none of the functionalities provided by learning management systems fulfils the requirements on the transfer level. From a productivity point of view, this level has a high impact on the external productivity, because with a guided transfer the business value on the customer´s side increases.

CONCLUSION AND OUTLOOK

With this analysis, an evaluation of learning management systems according to Kirkpatrick´s Four-Level Model has been presented. This holistic approach clearly showed that the state-of-the-art in learning management systems does only support the learning process on the levels 1, 2, and minor aspects of level 4. But especially for the transfer utilizable functions are missing. Using a productivity perspective this leads to high potential to increase the output-side of corporate education services, because only if the transfer of knowledge to the job is ensured and explicitly addressed the investment in learning creates business value.

As shown before, learning management systems could address these shortcomings, because the knowledge provided within a corporate education services is already in the system. Therefore it makes sense to add functionalities that directly focus on the transfer of this knowledge. I.e. it is possible to support this transfer by remote feedback cycles where the lecturer can individually help a participant to solve problems of his job with the learned methods. Furthermore it could be a promising approach to define small projects during the service delivery that every participant has to work on in his daily business. These projects could be managed and monitored by the lecturer and corporate supervisors using a learning management system. The advantage of such a solution would be that content of the educational service could decidedly linked to the project or milestones within and therefore provide hands-on support for the participant. Moreover, these functionalities can be used to evaluate the utility of a corporate education service based on actual changes on the job and not only with assessments.

After all we showed which aspects of corporate education services are addressed with state-of-the-art learning management systems on the one hand and on the other hand we derived implications for a better support of the transfer of knowledge, which is a main cause for corporate education. Therefore it can enhance the way of delivering these services and as a next step to evaluate them. This leads to a better understanding of corporate education services for scholars and gives practitioners support for decisions on educational services.

A first idea of the authors is a workflow tool with which it is possible to link the above mentioned learning objects and tools. Participants of the education service would have the opportunity to get supported by learning objects and tools of the learning management system in previously specified times in there workflows. Reached milestones of the workflows would reveal the learning progress of the participant to responsible instances and incidentally increase the performance of the participant of the education service.

In our further research we are going do focus on the transfer of knowledge and want to design functionalities that support this process to enhance the output of educational services. Furthermore these functions will be evaluated in different corporate education services to ensure the effects.

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