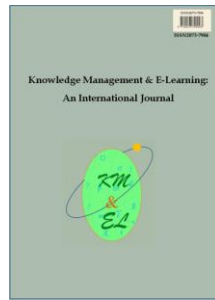

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Qualitative development of eLearning environments through a learner relationship management methodology

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Abstract: Due to paramount importance of knowledge, life-long learning, globalization, and mobility; eLearning as an information technology application has faced rapid growth in recent years. Disseminated war for talent enforces providers of eLearning products to identify technological gaps of learning and provide personalized services for customers of this industry. As we may know, designing customer-centered environments and managing end-user relations are the most effective elements in the market gain, due to the importance of customer satisfaction. The special features of eLearning systems with respect to their centers and users make them appropriate realms for applying a Customer Relationship Management (CRM) methodology. Learner Relationship Management (LRM), which is more specialized than CRM in eLearning context, plays a significant role in improving quality of services, enhancing learners' satisfaction and retention, keeping them, and recruitment new users. LRM provides an integrated infrastructure for eLearning systems and helps them to analyse learners' capabilities and find the best match to overcome the turbulent environment and tight competition. Also, by improving the service quality and enhancing teaching and learning flows, LRM offers personalized instructions to learners.

Keywords: eLearning environments; Customer relationship management; Learner relationship management; Quality development methodology; Learner satisfaction

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1. Introduction

A rapid development in information and communication technologies has changed the concept of literacy and faced the world with a new kind of illiteracy. In the twenty-first century, illiterate people are not those who can't read and write, but those who cannot learn and retrain (Barker, 2005). Increasing people need to acquire new knowledge and expanding the concept of learning to life-long learning, have forced experts to set-up new methods for qualified and low cost education using information technology tools. In addition to educational changes, economic reports show moving the organizational focus from industrial elements to information issues. Obviously huge amount of information needs a careful storage, retrieval, processing, and management. This information and its analysis are effective determinants of organizations' longevity and bring competitive advantages to them. Also, employers as assets of organizations should be familiar with new technologies and need vocational training and on job learning. Usually more than half of organizations' labors are not able to accompany technology. Kaliski, Kalinowski, Schumann, Scott, and Shin (2008) proposed staffs' awareness of new technologies increases their performance and can save 50 to 70 percent on the organization costs.

eLearning has been identified as a growing market; this is the direct result of an increased demand for training (Nagle & Golden, 2007). Its strategies to address economical, pedagogical, and technological goals increase its market demand. Providers of eLearning products apply some methodologies to expand their market size and the acquisition of new customers. Customer Relationship Management (CRM) is a methodology which helps to acquire new customers and avoids present customers' attrition through enhancing their loyalty (Bose, 2002).

Applying CRM techniques to the eLearning industry requires wide changes in both, an organization's internal and external processes and even in its strategy (Arjona, Ortiz, Mendez, & Peire, 2006). The adoption of CRM methodologies can be coherent in the learning process. In this approach, a learner is a customer of eLearning systems and all the processes of education and designing the system components are formed around them (Sabine, 2008). Therefore, the CRM concept can be referred to a Learner Relationship Management (LRM). Despite the importance of the learning aspects in the personal and social life and the span of the eLearning market, not many researches have addressed this issue comprehensively (Moisio, 2002). This paper describes LRM methodology and illustrates its advantages in eLearning environments.

This paper is organized as follows: In Section 2, eLearning is proposed as a business and we introduce its productions and services. According to the customer-centric nature of this business, in Section 3 we express CRM as a comprehensive methodology that provides an integrated infrastructure, satisfies customers, and increases the business revenue. Section 4 presents the LRM methodology and its effects on improving the quality of learning services. Finally, Section 5 concludes the paper and outlines areas for future research.

2. Market of eLearning business

Although education was known as a sacred value, nowadays the development of the knowledge-based economy drives education to apply information technology and is recognized as a business and source of income. In this business, knowledge is an explicit asset and human resources play key roles in its creation and transmission (Islam, Kunifuji, Miura, & Hayama, 2011). Many institutes invest on improving the knowledge of the human resources by providing high quality contents through many channels, and creating added values and sustainable competitive advantages for their organization (Edmond, 2006).

In order to respond to recent developments in many organizations, the eLearning industry expands its value chain. In addition, the rapid development of information and communication technology creates lots of dynamism and complexity in eLearning. Moreover, the lack of specific business models in this industry leads to business analysis problems (Nagle & Golden, 2007). However, Morrison (2005) divides the active part of this industry into three categories including.

Content is one of the main products of the eLearning industry that is created and shared rapidly. Content creation is influenced by three main factors, including the eLearning dynamism, Web 2.0 developments, and outsourcing of content creation (Dean, 2002).

Technology is the most dynamic sector of eLearning, which provides the necessary tools to create content and deliver them in a personalized way. Learning Management Systems (LMS) are the competition starting point for eLearning developers. Because of the LMSs dominant usage, eLearning products are identified with them. Applying at least one LMS in many organizations leads to rapid extension features of LMSs (Kaliski et al., 2008).

eLearning services cover wide areas, including many aspects such as advising and supporting learners, designing, creating, and hosting services. Users can benefit from personalized services in respect to their situation (Henry, 2005).

In another approach, all eLearning companies compete in four broad segments (Edmond, 2006) that are introduced in Table 1. It is noteworthy that interaction and integrity of all these sectors are needed to provide the highest quality products or services.

Table 1
Segments of eLearning industry

<i>Components</i>	<i>Creation</i>	<i>Content</i>	<i>Coordination</i>
Web content sources	eLearning authoring tools	Content packing	LMSs and LCMSs
Subject matter expertises	Live tools (including virtual classroom, web conferencing, ...)	Custom content development	Enterprise portals Enterprise CMSs
Digital rights management	Web 2.0 authoring and publishing tools		Unstructured searches
Learning strategy and planning consultancy services	Community and social tools		Business processes management

Considering the definition of illiteracy and placing life-long learning instead of durational learning, everyone needs learning and retraining in their lifetime and

technology is one of the best facilitators of it. eLearning can provide “cradle to grave” learning supports. For offering the optimal learning opportunity, learners’ profile should be portable not just between departments within a university or an educational institution, but also between different educational sectors. Providers of learning processes can be divided into two categories and eLearning appears as a tool for reinforcing both of them.

- Educational institution: Customers and dominant users of these institutions are students, their families, and future employers. Since determining the students’ future life and career are affected by the educational institution, selecting appropriate educational contents and instructional methods is an important task of the institutions (Daradoumis & Rodríguez-Ardura, 2010).
- Organizations and commercial enterprises: One way to provide a product or service quickly is offering the knowledge needed by the human resource at the right time. Vocational training and on job learning are some applications of eLearning that many organizations benefit from in order to train their employees. eLearning facilities can be critical to businesses and lead to integration and extension of the appropriate knowledge in organizations. Therefore, these organizations improve the return on investment (ROI) by reducing training costs and increasing the efficiency (Kaliski et al., 2008).

An appropriate user interface and the resulting easy work with the eLearning tools are important measures for educational institutions, while reducing costs is the most important criteria for other firms (Dietz, 2001).

3. Applying CRM in eLearning environments

An important survival factor for eLearning providers like other industry owners is attracting new customers and keeping them (Daradoumis Haralabus et al., 2008). This issue calls for defining and applying relationship strategies and managing customers’ interactions. So, eLearning providers should define all activities directed to establishing, developing, and maintaining successful long-term relationships with students and other stakeholders (Shaik, 2005). Applying the CRM methodology in this industry can lead to this desired goal and bring many other advantages to the organization.

Zeng, Wen, and Yen (2003) defined CRM as “all the tools, technologies and procedures to manage, improve, or facilitate sales, support and related interactions with customers, prospects, and business partners throughout the enterprise”. Also, it is “a business strategy and a set of discrete software tools and technologies with the goal of reducing costs, increasing revenue, identifying new opportunities and channels for expansion, and improving customer value, satisfaction, profitability, and retention” (Grant & Anderson, 2002).

Bose (2002) claimed that organizations must now be customer-centric and adopt a one-to-one marketing paradigm. He believes organizations will be more successful if they concentrate on obtaining and maintaining a share of each customer rather than a share of the entire market. Information technology is the enabler factor that helps to provide integrated infrastructures and improve customer communications and satisfaction.

Fortunately eLearning is a customer-centric business. In addition to business problems, considering pedagogical and technological goals, eLearning strategies are always designed around customers. Because of eLearning tools, infrastructures, and cultures, using CRM in this industry can be virtual. Therefore, CRM can be proposed as

eCRM (Daradoumis & Rodríguez-Ardura, 2010). Using eCRM tools, a set of characteristics and behavioural information of eLearning customers, especially students, is integrated and stored. Processing this information creates knowledge about them and enhances the quality of learning services. Available eCRM tools in the field of education allow managers to use the databases capabilities, data monitoring systems, and interaction technologies in order to obtain and store the huge quantities of information on the characteristics and behaviour of students (Daradoumis Haralabus et al., 2008).

Implementing CRM in educational institutions that use eLearning tools requires the following pre-requisites:

- These institutions should specify their strategy, mid-term and short-term objectives, and appropriate indicators for them.
- All the internal and external processes of the educational organizations and quality mechanisms for appropriate actions should be specified. In this respect, the aggregation and integration of processes and information support systems are key issues.
- System access points and communication channels for learners should be specified.
- In addition to doing change management, specialized services, tools, and their applications should be offered to tutors and staffs.
- Educational institutes should be able to gain knowledge about their students using available information, even if it is incomplete or partial.

Differences of applying CRM methodologies in educational institutes and other businesses are shown in Table 2 (Dietz, 2001).

Table 2
CRM goals for educational institutes and businesses

<i>Educational institute</i>	<i>Business</i>
Increasing learner services	Increasing customer satisfaction
Life-long learning	Increasing revenue from existing customers
Recruiting new students	Acquiring new customers
Keeping students	Improving retention rate
Increasing self-services	Reducing customer support requirements
Reducing service costs	Reducing transaction cost

4. Learner relationship management

Grant and Anderson (2002) identify customers of educational institutions as students, alumni, faculty members, and staff members. However, lots of eLearning tools are focused on the students' area. So, LRM tools can be assimilated with the learning tools and create an integrated learning environment (Lemon, 2005). In the following, after discussing the tasks of LRM, the learners' life-time in educational environments, and the quality of learners', we propose two models of applying the LRM methodology in eLearning environments.

4.1. Tasks of LRM

Integrated learning mechanisms have certain added values for educational environments. Applying a LRM methodology in eLearning systems can lead to an integrity and

establish the necessary mechanisms to ensure learners’ performance and satisfaction, and facilitate their success (Arjona, Ortiz, Mendez, & Peire, 2006). Main tasks of LRM are defined as:

- Providing step by step guidance for learners during the learning period
- Acting as a central point between learners and other elements of the learning environment
- Implementing and disseminating policies and laws of the learning environment
- Receiving and investigating learners’ complaints and sending them to relevant divisions
- Monitoring the delivery of learning resources to all learners
- Applying orientations and other related events to learners
- Exporting periodic publications and delivering the latest information and learning news to users
- Reporting concerns, different views, and suggestions through different means
- Organizing and facilitating learners’ meetings, disseminating related information and tracking the flow of relevant organizations
- Encouraging and monitoring the formation of learning groups
- Maintaining and updating learning portal

Using data mining methods and tracking learners and work flow processes can help the institution to model learners and create their profile (Kim, 2012). Moreover, LRM covers evaluation and measurement tools as the key components and provides feedback and educational guidance to learners.

4.2. Learner life-time in educational institutes

Ultimately, whether an institution is a public or private one, the revenue generation is an important factor. Potential revenue that learners can bring to the educational institution in their life-time is shown in Fig. 1. The revenue is the ultimate driver, while prospect, student, and alumni satisfaction are the means to that end (PeopleSoft, 2007).

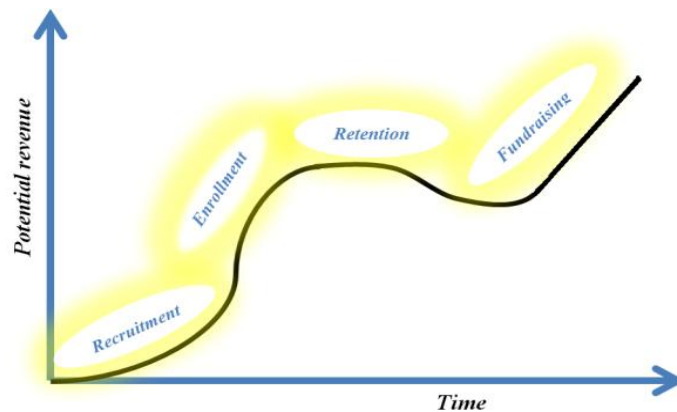


Fig. 1. Student life-time in educational institution

As Fig. 1 shows, students in learning environments pass four stages. In each stage, there are certain challenges that can change the organizations’ revenues. The black curve

shows the income opportunities that the students' presence will bring to an educational institution. The stages of the students' presence are:

1. Recruitment: The first stage is one of the most difficult stages, because of the competitors' influence and low system data about each student. In this stage, the institute should generate enough interest among the prospective students to hit their enrolment targets.
2. Enrolment: When the institute has a pool of candidates, it must attract the students with strategies and affective applications.
3. Retention: After attracting the students, the institution needs to apply specific methods to retain them. Owners of the institute should consider that students' drop out in the first year is more than other times.
4. Fundraising: After graduating the students, the institution needs to continue nurturing their relationships to drive additional contribution revenues. Most institutions find that their alumni represent a huge opportunity, but realize only a part of the potential.

Educational institutions recognize that they must maintain a positive relationship with their students, if it is to provide great students' experiences which enable them to recruit, retain, and fundraise all activities that impact the revenues.

4.3. Quality of experience

Providing personalized services is one of the main features of eLearning systems. In addition to information and knowledge of learners and other users of eLearning systems, previous learning experiments reinforce the preferences and expectations of users (Romero & Ventura, 2010). Learners' quality of experience (QoE) is affected by four main components including the quality of service (QoS), the system usability, the flow, and the learning. These parameters are different for various people and lead to variant learning experiments with different qualities (Sabine, 2008). About these components following tips are discussed:

- QoS deals with the quality of learning contents, the network status, and the application parameters such as delay, jitter and lost.
- Usability is defined by the ISO 9241 standard as "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use". Usability can be measured by considering methods of content presentation, application proactivity, user activity, and hypermediality (Ardito et al., 2006).
- Learning is defined by various training and learning methods, learning styles and theories, the quality of feedbacks and interaction effects such as skills and challenges.
- Flow describes a mental concept and is related to parameters with subjective or affective characters (such as trade-off between challenges and skills, focused attention, innovation, understanding of some concepts like control, fun, time distortion and interaction). Flow is used in computer based environments and explains customers' behaviour in the Web, so it should be updated frequently. Flow's positive effects can consider interests, brand, and longer time of site's visits or even learning and positive mental experiences (Esteban-Millat, Rodríguez-Ardura, & Meseguer, 2009).

QoE is a parameter for measuring students' satisfaction. Sabine (2008) indicates that LRM can improve the QoE in eLearning systems. Obviously, the success of LRM in academic environments depends on the integrity and regularity of all organizations' parts (Townsend, 2001).

4.4. Applying LRM in eLearning environments

Despite all the benefits of integrating CRM in learning environments, there is not great effort in this respect. One reason for this issue can be the lack of a complete model that considers all the learning parts together. Jigsaw is a simplistic model that covers four main categories of online educational support systems. Content creation tools, LMSs, Student Management Systems (SMSs), and accounting systems are Jigsaw components. This model is designed to exchange data more seamlessly (Paulsen, 2002). Since the importance of each component in this model is equal, Jigsaw cannot be appropriate to cover CRM methodologies. In addition, this model doesn't cover all the involved components of eLearning environments. For solving these problems the Hub model was designed.

The Hub model is a complex model for integrated online educational environments; which was introduced by Paulsen (2002). The Hub model considers the institutions' need to rationalize the operation to handle the growing number of online students and courses. This model is termed Hub model to indicate that the SMS is in the main focus. The SMS is the most important system in large-scale online education, because of historical, legal, and financial reasons. The SMS is the master system and all other systems that offer online education services should rely on. The Hub model includes CRM systems and prospective systems to show the need to integrate with marketing and sales related systems. It also includes logistics systems to show that it could be necessary to integrate systems that handle shipment of textbooks and other physical material to distance students. Fig. 2 illustrates the Hub model.

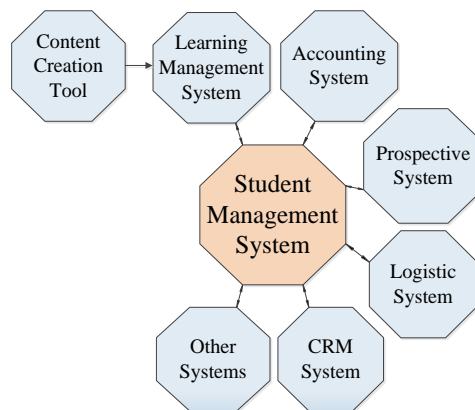


Fig. 2. The Hub model

Although the Hub model assimilates all the educational parts, it does not provide an appropriate integrity. All the educational parts interactions are accomplished through the SMS and this issue causes the SMS to become a bottleneck in the entire system. Implementing an integrated infrastructure helps these parts to interact directly.

LRM can influence various parts of eLearning environments, and leads to an increased income and customer satisfaction. On the other hand, the effectiveness of

instructional programs, improving registration, usage, and educational activity collaboration and increasing the ROI of the educational institution appear as further LRM achievements (Daradoumis Haralabus et al., 2008).

5. Conclusion

People-ware is one of the most important pillars in recent technology-enabled businesses and organizations. The rapid development caused by information technology is one of the major obstacles most of these organizations confront. To conquer such a battle, LRM provides organizations with learner-centred educational systems. It leads to establishing strategies for attracting new customers, increasing their satisfaction, managing their relations, and preventing their attrition. In addition, using LRM educational institutions provide an integrated infrastructure that can be employed to enhance performance of monitoring, learning, and assessment process. Subsequently, it can lead to an appropriate learning process and enhance not only the learners' performance, but also their satisfaction and quality of experiences. Therefore, learners bear the vast opportunity for additionally contributing to the revenue of these institutions.

Although applying the LRM methodology reinforces eLearning environments in general, the enhancement of information and communication technologies and their applications are going to add many new dimensions to eLearning systems. Future work will concentrate on implementing the eLRM methodology in eLearning environments and clear up details of software and hardware infrastructures. In addition, the integrity of LRM, supply chain management (SCM), and enterprise resource planning (ERP) systems in knowledge based organizations needs to be studied in all the data, service, process, and business levels precisely, which will be also in the focus of our research.

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