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AMCIS 1999 Proceedings

Americas Conference on Information Systems (AMCIS)

December 1999

Designing Learning Information Systems to Customer Needs

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Abstract

The paper presents a marketing-oriented approach to the analysis and design of learning IS. In order to explain the phenomenon of success and failure of learning IS the term “user net value” is introduced. Using this concept, recommendations for a successful design and implementation of learning IS are presented.

Universities in Transition

During the last decade universities around the world have been facing increasing public pressure to reduce costs and improve output. In this context information technology - and especially learning IS - are often seen as the remedy for an under-performing university system. Current research has shown that there should be no doubt about the educational effectiveness of online lectures (see Beller et al. 1998; Harasim et al. 1995). On the other hand, the question of success and user-acceptance of learning IS still remains. Will learning IS meet universities' expectations or will they serve as another case study for IS failure research?

IS Failure

In the relvant literature two different categories of definitions of IS failure can be found. One category of definitions does not focus on possible sources of failure, the other one does. The following definition is an example of category I: "An information system has failed when it does not perform as expected, is not operational at a specific time, or cannot be used in the way it was intended (Laudon et al. 1998)". Other authors try to emphasize important influences on IS failure, e.g. "System survival is intimately linked to project organization survival. When support for the project organization evaporates leaving dissatisfaction at the termination of the project, then the system can be said to have failed (Sauer 1993)." Among the definitions in category II some focus on usage rate and other user-related factors. I want to follow this direction by introducing a user-centered approach for the determination of IS success/failure.

Understanding Customers

Research on mass information system failure has shown that target groups of mass information systems have to be clearly defined and specifically addressed (Hansen 1995). Social and behavioral factors play an important role when it comes to information system design and implementation (Lucas 1975).

Inspired by this research, the term "**user net value**" is introduced in order to gain a better insight into IS failure. The term user net value has been derived from Kotler's total customer value (Kotler et al. 1994) and, similar to its Marketing counterpart, the user net value of a (learning) IS is determined by deducting user costs from user gross value.

User gross value positively correlates with the level of satisfied user needs: the higher the level of satisfied needs, the higher the level of user gross value. Four different levels of user needs can be distinguished: basic, expected, desired, and unexpected needs (Albrecht 1993). A successful learning IS should satisfy at least basic and expected needs, which can be directly derived from corresponding traditional lectures and/or user surveys. Learning IS might satisfy unexpected needs by providing additional IS knowledge when serving the user, or a new kind of enjoyment by using the system instead of a conventional lecture. This phenomenon was observed when we surveyed users of an online Web-based learning information system for cost accounting at the Vienna University of Economics and Business Administration.

User costs combine all monetary and non-monetary costs that occur when a learner uses the learning IS (e.g. time spent on getting used to the system, costs of setting up and maintaining access to the IS, search costs for particular information, etc.).

As a result of the aforementioned analysis I assume that the rational user will prefer a learning IS as soon as her/his personal user net value of the learning IS exceeds the total customer value of the traditional lecture. In order to develop a learning IS that complies with these demands learning IS managers have to develop a system that provides a high user net value for the learners. The following paragraphs provide an insight into how this might be realized.

Components of Learning IS and their Influence on Success and Failure

Figure 1 provides an overview of key components of an learning IS that influence user net value.

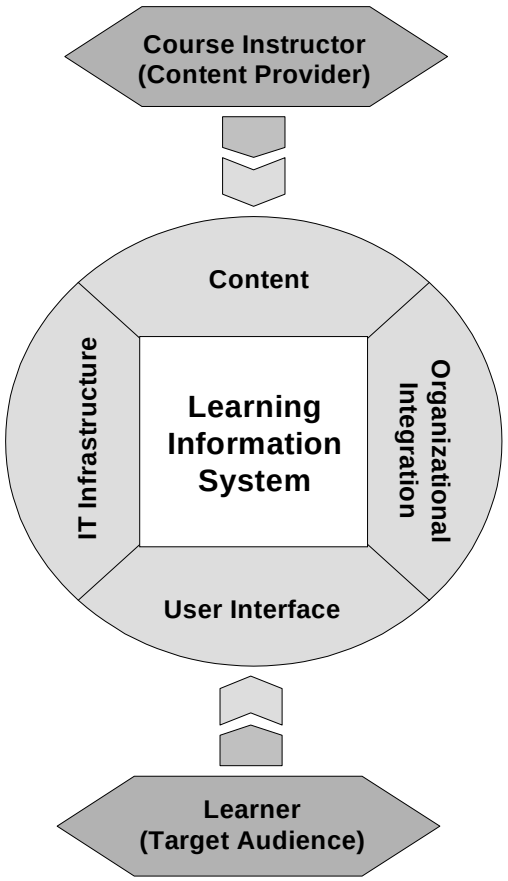

Fig. 1 Key components of a learning IS with impact on user net value

The **content** of the learning IS must be considered as the biggest contributor to user gross value. It is the task of the learning IS manager to attract the best content providers (= online course instructors) for the system. For this purpose constant observation of the market is highly recommended.

A tremendous potential for a high user gross value of the learning IS also lies in the organization and presentation of the content. Using sophisticated presentation tools can extend the user gross value of the content. SKILL, a scalable Internet-based teaching and learning tool, for example, enables the learner to adapt the syllabus of a course within a given framework to his/her personal needs. The basis for this new flexibility is a knowledge pool from which the course instructor can select a set of presentation units. The application is based on open Internet standards like CSS and XML (Neumann et al. 1998).

However, unstructured organization and presentation of the content may lead to an increase in user costs. Providing a highly organized system can minimize the amount of time a user spends on searching for a particular piece of information (for a user-integrated method for the content organization process see Fuccella et al. 1998).

The **user interface** can also have detrimental effects on user net value. Designing learning IS to state-of-the-art design standards is mandatory in order to please the user and reduce his/her efforts in getting used to the system. In this stage usability testing can be very helpful and can be considered as one option to increase the user net value of the IS (see Redmond-Pyle et al. 1995 for an overview of user interface evaluation; Hall 1999 provides an in-depth analysis of instructional Web site design principles).

Although the **organizational integration** of the learning IS does not directly affect user net value, research has shown that organizational integration plays a vital role in sustaining on-going development (Sauer 1993). Content coordinators should serve as a service unit for content providers and users, constantly scanning the system for potential weaknesses. Support from university's top management and from faculty are crucial to the success of the learning IS. In Europe many learning IS initiatives are the product of the scientific curiosity of a single faculty member with no or only moderate support from top management. Without the commitment of university's top management and financial support, learning IS initiatives are likely to fail early on (Müller-Böhling 1997). On the other hand, learning

IS initiatives that are established without faculty involvement are threatened by a reluctant usage rate - or worse - by the boycott of the IS as was the case at York University (Noble 1998).

As far as **IT infrastructure** management is concerned, the demands of a learning IS should not differ from those of conventional IS.

Recommendations for Learning IS Managers

The following recommendations for learning IS managers can be summarized from the analysis:

1. Secure support from top management.
2. Secure support from faculty.
3. Constantly scan the market for potential content providers.
4. Use value-added software for content presentation and organization.
5. Provide a service facility for content providers.
6. Provide a service facility for learners using the system.
7. Implement a state-of-the-art user interface.
8. Try to get user feedback on a regular basis.
9. Adapt learning information systems to learner needs.
10. Use state of the art IT infrastructure and keep 'mean time between failure' low.

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