MANAGEMENT INFORMATION SYSTEMS IN HIGHER EDUCATION
Key Factors of User Acceptance

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Abstract: The pan-European management of higher education has resulted in management information systems being developed by the universities to administer courses and examinations more effectively and more efficiently. Management information systems in universities have to meet particular requirements, as they not only have to ensure that large volumes of data are managed smoothly; they also have to take account of complex decision-making structures. Object of research of the present study is the most widely distributed university management information system in Austria. The aim is to analyse user acceptance of students based on the following key factors identified: usefulness, ease of use, trust, registration/cancellation methods and mandatory use. Drawing on statistical data of more than 1,100 questionnaires the survey focuses on the critical success factors and provides recommendations for measures to encourage acceptance of management information systems.

1 INTRODUCTION

While the last few years have primarily seen the publication of works on the technical and organisational implementation of university management information systems, more recent publications present initial findings of case studies on user acceptance. However, there are still no comprehensive, empirical findings. In the literature, the term acceptance refers to the recurrent decision on the part of an individual to make frequent task-based use of an information system (Venkatesh and Davis, 2000; Govindarajulu, Reithel and Sethi, 2000). For the user, acceptance problems mean that his perceptions about completing tasks using management information systems are only given minor consideration. Knowledge of the variables that influence acceptance is however crucial for the development of information systems. It is therefore important to view empirical research into acceptance in close context with research on implementation. The model from Davis (1989) has frequently been the subject of empirical surveys in acceptance research: The Technology Acceptance Model is adapted according to the application (Schepers and Wetzels, 2007; Burton-Jones and Hubona, 2006)

with studies on user satisfaction (Baroudi and Orlikowski, 1988; Melone, 1990) also making an important contribution. Further approaches have been developed, such as the Task-Technology-Fit model (Gilbert and Kelly, 2005; Goodhue and Thompson, 1995) or combined research models (Klopping and McKinney, 2004; Dishaw and Strong, 1999; Compeau and Higgins, 1995).

2 UNIVERSITY MANAGEMENT INFORMATION SYSTEMS IN AUSTRIAN UNIVERSITIES

The new regulatory framework for universities in Austria over the past few years has also required that a change be made to how courses and examinations are administered. As early as 1998, a new concept of degree courses started at Austrian universities with international credits for examination performance. The majority of Austrian universities now use the system UnigrazOnline (UGO) developed by Graz University of Technology and accredited by EUNIS (European University Information Systems Association). The management information system can be used both by staff and students.

Alongside having to use the system to register and cancel a registration for courses and examinations, students are also free to use additional options: For students authorised to use the system, the course units can be transferred to a personalised electronic timetable. Additionally, a personal business card can be generated or an automatic e-mail can set up that provides information about events at the university. 'Personal settings' concern the system-specific display options, such as 'account status' with individual details (validity of the password, e-mail address, transcript of records). A further service can be used to import a digital image for the personal identification ('unicard image upload'). In the discussion fora, the students are able to communicate electronically with other course participants.

3 RESEARCH DESIGN

The aim of the survey was for at least 300 students from each of the faculties of Social and Economic Sciences, Law and Natural Sciences to take part in the written survey. Setting a benchmark for the number of respondents and focussing on three of the total of five faculties at Graz University was crucial to ensure that the process of data collection did not get out of hand. After a preliminary study, it was possible for the written questionnaires to be used in a total of 29 courses just two months after the university-wide roll-out of the system. The frequency of active use outside the registration periods was surveyed, as registration for courses and examinations have to be carried out using UGO, and any enquiry into frequency of use during this registration period would have produced biased results.

The questionnaire is divided into several sections with a series of open and closed questions on the degree of use and on the main areas of focus: usefulness (Lee and Kim, 2009; Davis, 1989), ease of use (Chen, Yen and Chen, 2009; Davis, 1989), registration/cancellation methods, trust (Milchrahm, 2003; Dyer and Chu, 2000; Macy and Skvoretz, 1998) and mandatory use. In the context of the factor usefulness it is assumed that there is a positive correlation between the quality of information provided and the level of user acceptance with respect to the information system (Gatian, 1994). Thus, questions about the access of important course information or services making the curriculum easier for students are included. Regarding ease of use,

basic prerequisites of user friendly information systems are well structured presentation and useful search functions. Another important aspect is the support of the user in the completion of a given task. Concerning university management information systems it means, for example, that the registration for courses has to be easy to manage. Registration methods with an optimal allocation of course places play also a crucial role in the research on user acceptance among students. Besides, the stability of the system should prevent registration chaos even for mass registrations. Apart from the technical security, it is assumed that contacts and FAQs (Frequently Asked Questions) strengthen user trust in the system. Furthermore, information on the institutes' webpages should agree with the information in the university management information system. With regard to mandatory use, a further question is included. Finally, socio-demographic information, such as the age of the respondents, completes the questionnaire.

4 RESULTS

1,102 questionnaires were distributed and all of them were capable of being analysed: 343 respondents (31%) of the faculty of Social and Economic Sciences, 348 students (32%) of the faculty of Law and 406 (37%) of the faculty of Natural Sciences. Two further respondents belong to another faculty and three respondents did not provide information about their faculty. The average age of female students (60%) was 21.88, whereas the average age for male students (40%) was 22.95. On average, the respondents were in the 4th semester of their study.

Table 1 provides a summary of the descriptive statistics on the questionnaires. The dimension frequency of use encompasses 'daily', 'several times a week', 'once per week', 'several times a month' and 'once per month or less'. The possible responses to the other areas of focus range from 'disagree', 'disagree somewhat', 'undecided', 'agree somewhat' to 'strongly agree'. With respect to frequency of use, the median 'several times/week' denotes that 50% of the responses relate to either a more or less frequent use of the system.

Table 1: Key factors and acceptance features.

Key factor	Acceptance feature	Median
Frequency of use	Frequency of use of UGO outside the registration periods	Several times/week
Ease of use	I find it very easy to register/cancel registrations for courses and examinations.	Strongly agree
Ease of use	The user interface of UGO is very easy to understand.	Agree somewhat
Ease of use	I find the general search function in UGO very useful.	Undecided
Usefulness	Using UGO saves me going to different institutes.	Agree somewhat
Trust	Information on courses on the institutes' webpages agrees with the information in UGO.	Undecided
Trust	Notifications about course changes work.	Agree somewhat
Trust	The stability of UGO prevents registration chaos even for mass registrations.	Undecided
Usefulness	I am able to access important course information using UGO.	Agree somewhat
Mandatory use	I only use UGO because I have to and not because I find it helpful.	Disagree somewhat
Trust	I know who to approach when I have problems relating to the content of the system.	Disagree somewhat
Trust	I know where I can find FAQs.	Disagree somewhat
Registration/ Cancellation methods	I prefer to register in person for courses.	Disagree
	A 'first come, first served' allocation of places is optimal when registering for courses.	Disagree somewhat
	The allocation of places during course registration is optimal and takes the requirements of the curriculum into account.	Undecided

The implementation of the system for registering/cancelling a registration for courses and examinations in UGO can be seen as successful, as the majority of respondents find the electronic process very easy. This result is also encouraging, as the students have to use the corresponding services and high acceptance can also have positive effects on the pattern of use of other services. The clarity of the user interface as a feature of the university management information system's ease of use is judged relatively good. The results into the questions whether the general search function is very useful and whether the course information on the webpages agree with information in UGO show a somewhat indifferent picture.

Even though there is some potential for improvement in terms of the consistency of information, the relevance of the published information was hardly called into question. The task of the management information system to publish important course information has been achieved in the eyes of the students questioned. Regarding the factor of mandatory use the results reveal that the majority of the respondents do not only use the system because they have to. Instead they use the system because they find it helpful.

In principle there is support through contacts. However, 31% of those surveyed had no idea who to contact with questions regarding the content of the system. Combined with the ease of access of FAQs, also perceived as poor, some action is required here.

The question about registering in person for courses is based on the assumption that user acceptance of the university management information system also depends on the attitude to the registration methods. A strong preference for registering for courses in person (for example in the institute's registration office) could be interpreted as a somewhat negative attitude towards electronic registration methods. However, it has to be stated that such a preference has various reasons. The allocation of course places by means of a chronological registration sequence using waiting list (first come, first served) is rather unpopular with the respondents.

The point mentioned most frequently with respect to suggestions for improvement is, first and foremost, the aspect of clearly represented information, followed by additional information (information about courses and waiting lists, sample curricula), improved additional functions (FAQs, better search function, better print options) and the system's ease of use. At the same time, the complex functions with countless, automatically opening windows is criticised. Further problem areas concern the design of the user interface with the graphic format of the system being seen as antiquated and dull. A more modern image was therefore proposed by several students.

5 CONCLUSIONS

The survey into user acceptance of the university management information system has shown that the take-up of the system by students has been good, with usages of several times a week outside the registration periods. The following main areas were identified as key factors: ease of use, usefulness, mandatory use, trust and registration/cancellation methods. Areas of weakness emerged in particular in the last two. This means that, on the one hand, greater awareness training is required in terms of contacts and online help and, on the other, the allocation of course places on the basis of a chronological sequence of waiting lists should be re-considered. Special information on degree programmes and the preparation of sample curricula could be of considerable benefit as an information guide, particularly for those in their first semester, and was therefore explicitly requested by the users surveyed. A better positioning of FAQs and an extension of this static help facility in the form of so-called interactive 'wikis', on which several interested people work as an online dictionary, could significantly improve the available help. This could lead to reinforcing users' trust in the system.

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