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USAGE OF STUDENT AND ADMINISTRATIVE MANAGEMENT SYSTEMS (SAMS); A case study of user perceptions at an Australia university

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ABSTRACT

Student and Administrative Management Systems (SAMS) have been widely implemented in educational institutions and universities worldwide. SAMS is designed to assist and improve performed by administrators, academics, and students. However, with widespread usage of these systems in universities throughout the world, the evaluation of the task-enhancing features of such systems to users becomes critical. The objective of this study is to explore the use of SAMS as perceived by users as; academics, administrative staffs, system administrators, and students in Australia university (AU). The examination uncovered the difficulties associated with SAMS usage and resultant actions undertaken by users. These users were facing more difficulty to use the systems due to such the misfits from the implementation and organization setting. In respond, workarounds take place when the system can not delivery or support to the usage.

Keywords: Student and Administrative Management Systems (SAMS), systems usage, misfits, workarounds

INTRODUCTION

PeopleSoft claims that the benefits of system implementation would enhance the performance of organizations (including academic institutions) in their daily operations, and “increase staff and faculty productivity through automated process, and decreased service times”. The PeopleSoft CRM, intended for higher educational institutions, is said to provide industry-specific functionality, and a configurable and extensible framework- all of which lead to easier integrations, quicker implementation, fewer customizations, and reduced maintenance and training. Similar claims are made by SAP. However, these claims were found to be inconsistent with the experiences of the actual users of such applications, one of which is the Student Administrative Management Systems (SAMS), the focus of the paper. SAMS is designed to enhance the core business processes in academic institutions, involving administrators, teaching staff, and students. Modules in SAMS, slightly different from standard Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) applications, include student enrolment, course timetabling, accounting and financial management, and other education-related modules. Even though it is highly recommended to configure SAMS meet particular work requirements, the “vanilla” approach, reflecting industry “best practices”, is often encouraged by vendors, resulting in significant process reengineering that is negatively perceived by end-users (2001; Pollock and Cornford 2004; Wagner and Newell 2004; Olsen and Sætre 2007).

Despite several studies in ERP implementation in private sector enterprises, the only significant research that has been undertaken on ERP projects in universities is the seminal work of Wagner and Newell (2004). Thus, it is deemed important for higher educational institutions to examine the experiences of their staff with use of SAMS in performing tasks (Karl and Catherine 2007), which can pave the way for considering alternative suggestions directing the use of SAMS (Selwyn 2007). Given that ERP presented the problems for users in doing their tasks, the objective of this study is to explore the use of SAMS as perceived by users as; academics, administrative staffs, system administrators, and students in university. The secondary objective is to explore how users are dealing with the constraints of their system usage. In this research, the study does not produce generalisable results according to the select of representative country. However, these findings would help to contribute and insight to the theory development.

LITERATURE REVIEWS

In recent years, a growing number of Higher Education Institutions (HEI) worldwide have explored the use of ERP as a means of supporting their organizational processes, while linking areas like financial, real estate, and staff management, management of students, and support of teaching and learning (Esteves 2005). Adoptions of ERP systems have become widespread in higher education institution (HEI), as many universities worldwide have adopted ERP systems to replace their legacy service systems (Pollock and Cornford 2004).

According to the research study by Nielsen, J. (2005), UNSW was the first Australian university to implement ERP systems. It also shows that ‘Callista’ is also widely used and that a number of institutions such as: Deakin University, Edith Cowan University, Monash University, Latrobe University, Northern Territory University and University of Western Australia.

There have been a number of successes and failures of ERP implementations in universities, although there are only a few reported of successes (Beekhuyzen, Goodwin et al. 2002). The Australian newspapers have reported on ERP project failures in prominent universities in the country (Lawnham 2001; Brown 2002; Madden 2002). Consequently, research in Australia higher education has reported a complex set of problems with ERP implementations that appear to be unique to universities (von Hellens, Nielsen et al. 2005; Rabaa'i, Bandara et al. 2010). The non-flexible nature of ERP solutions force organizations to change existing business processes, which might have been effective, to fit the “best practices” embedded in the package (Themistocleous, Irani et al. 2001). Olsen and Sætre (2007) also point out the “black box” nature of ERP systems that renders embedded business processes invisible to end-users.

Information systems (IS) usage has been a key area of IS research for the last two decades (Lin and Bhattacharjee 2007). However, the IS field has no generally accepted definition of system usage. Burton-Jones and Straub Jr. (2006) proposes that system usage is an activity that involves three elements (Figure 1): (1) user (i.e., the subject using the system), (2) system (i.e., the object or tool being used), and (3) task (i.e., the function being performed). Burton-Jones and Straub Jr. (2006) define individual-level system usage as an individual

user's employment of one or more features of a system to perform a task. Therefore, in order to explore the individual and organizational impacts of system usage, it is essential to analyze and define the context of system usage (system, task, and user).

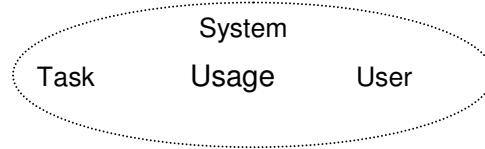


Figure 1: The system usage (Adapted from Burton Jones and Straub (2006))

Many literatures report that the IS implementation brought the change to the organization. Change management is the strategies to improve business process by adopt or implement a new system, in order to enhance and support to the tasks and productivities. However, an IS solution may be technically adequate but still not fit the ways people work in a particular setting (Markus 2004). Many organisations have found that *unusual* business processes are not well supported by the software (Markus, Petrie et al. 2000). Misfits arose from incompatibilities between organizational requirements and the underlying data model which could be conflicted to the architecture of the specific software (Johansson and Björn-Andersen 2007). Specifically, an event encountered in IS use where information cannot be properly processed through existing IT functionality or process design, thus triggering improvisations (McGann and Lyytinen 2010). The ideal of improvisations is to support and minimize the problems or constraints from the system or IT implementation. It is in situated performances in which thinking and actions emerge simultaneously, and on the spur of the moment (Ciborra 1999). Otherwise, users may create their strategies to cope and handling these limitations that support for their needs. Improvisation is a well-grounded process that can be leveraged to address those situations in which rules and methods were inadequate in task performance (Ciborra 1999). Consequently, employees must constantly adapt to new applications, functionalities, and workflows (Ragu-Nathan, Tarafdar et al. 2008). The adaptation process can occur in the different period of pre-implementation, implementation, and post-implementation (Beaudry and Pinsonneault 2005). These problem solving behaviors have been conceptualized as “workaround” (Vogelsmeier, Halbesleben et al. 2008). Such as Boudreau (2003) explains “tweaking,” as one of the workarounds that allows users to use the system in an inconsiderably different way than it was supposed to function. The clusters of workarounds could suggest promising areas of attention that can be devoted to the enhancement of information systems (Petrides, McClelland et al. 2004).

RESEARCH METHODOLOGY

Case studies can be used for different types of research purposes such as exploration, theory building, theory testing and theory extension/refinement (Voss, Tsikriktsis et al. 2002). It is often used where it represents a critical case or, alternatively, an extremely or unique case (Saunders, Lewis et al. 2007). The case study is popular by many researches as they can quickly discover the outcome from the problem situation. Yin (1989) cited by Vaus (2001) include that such a case can provide a moderately convincing test of a complex theory. Our research study is believed that case study approach is appropriate for the investigation of case when it is necessary to understand parts of a case within the context of the whole (Vaus 2001).

While research on system effectiveness has been greatly reported in the literature, gaps still exist in a number of areas especially when evaluating effectiveness at the user levels in term of effective usage and impact on user work task (Masrek, Karim et al. 2007). However, because system usage is a complex activity involving a user, IS, and task overtime (Cronbach 1971; Burton-Jones and Straub Jr 2006). Therefore, the researcher must choose appropriate measures for the objective, theory, and methods (Burton-Jones and Straub Jr 2006).

It is difficult to imagine how IS can be assessed without evaluating the impact it may have on the individual's work. In order to answer these questions, our empirical study will be conducted to exam how a user employs a SAM system in the task using a very, very rich measure (Figure 2).

Richness of measure	Rich (IS, User)	Rich (IS, Task)	Very Rich (IS, User, Task)	Very, very Rich (IS, User, Task)
Type	Extent to which the user employs the system	Extent to which the system is used to carry out the task	Extent to which the user employs the system to carry out the task	How the user employs the system to carry out the task
Domain of content measured				
Example	Cognitive absorption	Variety of use (number of subtasks)	None to date (Difficult to capture via a reflective construct)	Qualitative data and methods
Reference	Agarwal and Karahanna (2000)	Igbaria et al. (1997)	Burton Jones and Straub Jr. 2006)	

Figure 2: Adapted from Rich and Lean Measures of System Usage (Burton-Jones and Straub Jr. 2006)

Qualitative approach is utilized to discover outcomes such as: meaning, opinions, experiences or unexpected phenomenon from individuals or groups. They are more concerned about issues of the richness, texture, and feeling of raw data because their inductive approach emphasis developing insights and generalizations out of the data collected (Neuman 2003). Instead of trying to convert social life into variables or numbers, qualitative researches borrow ideas from the people they study and place them within the context of natural setting (Neuman 2003).

For the purpose of this study, we decided to focus on users owing to their extensive usage of SAMS in their daily tasks. The focus group sessions, involving 24 participants and semi-structure interviews with 2 IT/IS managers were conducted.

EMPIRICAL STUDY: System usage

In accordance with Følstad et al. (2004) and El-Kiki and Lawrence (2006), the categorization of users according to their frequency of interaction with a system, which includes:

- Administrative user refers to core user who must use administrative system as an important part of their work context.
- Academic user refers to user who interacts with the administrative system in their everyday work, but not as their primary tasks.
- Student refers to user who has limited interaction with administrative system in their work or everyday life.
- IS/IT manager refer to user who is responsible for the day to day maintenance and support the use of the administrative system.

In AU, there are two SAMS that have been running in parallel. The first application is said to have more features and able to support more functions. The second application had been implemented in 2006 with the aim to provide users with a more robust and user-friendly system. This application was aimed at supporting student management, course management, and online enrolment. The system is also web-enabled and run on centralized client-server architecture.

DISCUSSION OF FINDINGS

The research findings, based on focus group and follow-up by semi-structure interviews with the users in AU, enabled the authors to study the experiences of these users with the SAMS usage. Based on the research questions, the following issues emerged.

How are SAMS perceived by the users?

Requirements misfits

Functional misfits arise from incompatibilities between organizational requirements and ERP packages in terms of the processing procedures required (Shehab, Sharp et al. 2004) as administrative staff in various departments of universities have specific needs (Pollock and Cornford 2004; Rabaa'i, Brisbane et al. 2010). In the study, SAMS was not appropriately configured to meet user requirements regarding the relevant business processes, thereby leading to usage difficulties.

“The features of SAMS do not meet our work requirements. So, the functionality is inadequate. We end up having to do things beyond just one application. We are compelled to use a number of incompatible applications to do a certain task. We can not really rely on one system”.

Information technology is aimed at enabling organizations and its employees to operate more efficiently (Capel 2005). However, many users complained about the fact that their usage of the respective SAMS reduced their productivity. The failure of SAMS to boost the efficiency generated users' frustration with the system, resulting in their wish for a return to the previous application, a phenomenon observed by Berchet and Habchi (2005).

Inaccuracy of information

In organizations, up-to-date information is important and a vital requirement for effective operations and competitiveness. The lack of up-to-date information, on tasks such as student enrolments and results, provided by SAMS was an issue of concern voiced by the users in the university.

“Changes to student records are not reflected throughout the SAMS modules automatically. So, if a change was made to the student record with regards to grades, we will not have immediate access to that changes status till later (sometimes it can take up to 3-5 working days to access the updated information). This is no good because it leaves us in limbo with our information regarding the status of the student, which is of vital importance in our service to students.”

One of administrative staff mentions that she needs to work longer hours as:

“When, I have to submit the reports to get academic authorization for graduate students - I need to check against any error from the system such as information inconsistency or not matching with the document papers (the academic reference). This is a crucial task that becomes very time consuming.”

Imposition of SAMS-embedded business rules affecting user tasks

The perceived “imposition” of business rules, as part of the “best practices” package, embedded in SAMS also restricted the ability of end users in satisfactorily undertaking their tasks.

“In the past, I am able to cut and paste function from SAMS directly in to the excel worksheet. Now, I can't copy, highlight, cut and paste. So, a lot of functionality and access has been restricted. I mean the school's trying to centralize a lot of things and that could be part of the development or part of the improvement, but there's no point putting in business rules that restricts our tasks.”

ERP systems are often complex as they are designed to support a myriad of activities within the organization. Yet, to enhance the undertaking of tasks by end users, the features of the application need to be configured in a manner that allows simplified system-user interactions (Lieberman 2007). However, certain features of the applications were found to be unacceptably of usability by users.

“I think the searching facilities – we found very frustrating - complicated as there are too many search options and none are clear, so we are unable to perform appropriate searches to retrieve data that we need for our work.”

What are the influences that impact to SAMS usage?

Poor systems quality

There are many issues which lead to the poor system quality. For example, this is the results of poor design. Also, the systems are unable to deliver and respond for the purpose of use. In this research, the perceptions of system design are explained from the users' viewpoints which influence by the organizational policy.

In AU, the system is not easy to use as the design and procedure setting. A staff member mentions that:

"I don't understand why we need to log-in more than twice. It is very hard to remember all these passwords. I find it very difficult. It is very complicate. I think they make it harder for all different passwords."

Administrative staff also talk about the system functionality is difficult to understand.

"It is difficult to try work out how we can actually filter in to the databases to get that information."

Students also explain ineffective of the interface design which makes users find difficult to use the system.

"I think when I tried to search for information, just end up with go to different places in the web site. It is very confusing."

The lack of user requirements

In such a customer-developer environment, reaching and maintaining a common understanding of requirements is necessary for systems to be developed successfully (Coble, Karat et al. 1997). At AU, many academic users mention that the system is difficult to use. Users report that SAMS were more complicate to do their work as they couldn't understand the functions. The lack of usability has been defined as one of academic users mentions that.

"Somehow, the system should be simpler, more user friendly and far more easy. There are too many options. There should be the choice where you can use something simply."

In AU, the lack of functionality has been reported. Administrative users explain that they are unable to search for the information they needed. The system has no function to support for this particular task.

"If there a facility where I am able to go into someone account and may be a tick box identify and send that off, that will be a great for me. But unfortunately, we don't have the interface yet to provide that function."

How are users dealing with SAMS usage in doing their works?

Workarounds

In the university, users as academic found that the system does not having effective of functionality to use for the task. User expresses that she has to do something in order to get the information from the system.

"Sometime I need the number or I need the number for send them email for example. So, then I go to hunt that in my e-mail archive to see if the student number is there. As the link from the number to their email addresses is critical one. So, I need to setup my own spreadsheet with students in and their numbers and other information."

In the school administration where the systems are extensive use, admin staff found that they need to workaround the system as

"And in this situation now, we are using 4 databases which go back in to SAMS mainframe, but this is what we have to do, we have to crate other type of interfaces to try how to get new stand, how to get the information."

With the problem of compatibility issues, therefore, student needs to workaround by using alternative platform application to use the system as user find that:

“Because I am using Mac, when I ‘m using Mac with safari, go to check the exam timetable and exam result. The system always kicks me out. But when I was using PC with Windows with Fire Fox, I got it through.”

Adapt to use (Adaptation)

In the university, staffs adapt to use as they aware that the systems are not effective to their tasks. They need to adjust their tasks and procedures to working with the systems. In AU, academic staff found that

“The worse one is course editing guide system. It is terrible. I got to save here, because it is very hard to find. Then I go straight to here, log-in. The problem is when you editing. Occasionally, you cut and paste something in and it doesn’t save that.”

The limitation of system’s design has affected to user as he or she needs to alter the usage for the task. In the university administration, users adapt to use the system as the system is not suitable to their tasks.

Administrative staff reports that *“We could not have it as what we want to, and what we identify is that different types of theories and methodologies in term of how to navigate through that system which we normally use.”*

Manual use

According to similar results from the poor system quality, users find their ways of using workaround and adaptation methods to overcome the problems. However, many users also find that using manual as paper based is also the useful method to them. In AU, academic staff mentions that they are used manual method to prepare for the results.

According to administration is the area where SAMS is mainly used for the tasks. However, most of administrative staff mentions that:

“We do keep files, paper based files. But unfortunately it may not always necessary be accurate, you need to be constantly updated so you have to use that.”

As the problems with the system condition is not always up to date and unreliable. Therefore, staffs still need the manual as alternative to prevent any error that can occur from the system.

“I think one of the reasons that we can not rely on the system, because we do not trust the system. It’s many times the system falloff that make us worried. That’s why we keep our own like traditional way “photocopy” to keep the references.”

Students also report that as university’s enrolment procedure, first year student must enroll by using the manual or paper base form. While IS manager also confirm that when the problem from the system occur, and anything with the students, students are able to use manual based for their enrolments. In this research, manual workaround has been found from most of the users which is regarding as an alternative method that still exists and employ in the university environment.

Group of users	Perception	The effect	Improvisation
Academic user	Requirement misfit	Poor system quality	Manual workaround is used as backup source (references) and supporting material.
	Inaccuracy of information		Using the paper form to check against the system.
Administrative user	Requirement misfit	Poor system quality	The results need to validate by using spreadsheet and importing data into the document.
	Inaccuracy of information		Manual workaround is the alternative to support users.
	Imposition of software	Lack of user requirement	Copy data from screen and save as pdf file before mailing to the others.
Student	System incompatible issue	Poor system quality	User adapts to use different hardware and software platforms to access the system e.g. with Mac® need to use Tiger®, not Safari®. On PC, must use Internet Explorer® instead of Firefox®.
		System crash	Manual enrolment is an alternative solution.
	Poor usability	difficult to find the information and access the function	User created the links to the function and save the information as the document.
IS/IT manager	Inaccuracy of information	Poor system quality	Manual is employed to support the system constraints.
	System incompatible issue		The system is needed to adjust and modify before it can be utilize.

Table 1: Perceptions, effects and improvisations of SAMS usage in AU

CONCLUSION

The participants' responses were formulated in the context of their perceptions with their usage of SAMS, in accordance with the complexities and difficulties they encountered (Ribbers and Schoo 2002). The organizational change management in the institution affected the performance of administrative tasks. Moreover, user requirements regarding administrative tasks were not rigorously considered and incorporated by proponents of SAMS. In addition, the concerns, voiced by the users, were not sincerely examined by the IT project teams in the university, a situation that can potentially lead to serious user dissatisfaction and disillusionment (Sarkar, Cybulski et al. 2002). Systems usability in term of task analysis has not been evaluated and tested properly when the system implemented. ERP packages offer a great variety of standard solutions for individual business problems; however in practice, a lack of effectiveness and efficiency in large package implementations is reported (Ribbers and Schoo 2002). SAMS are essentially ERP systems, which need to be carefully configured and integrated the components of the system to meet the needs of organizational users (Daneva 2003). It has been pointed out that ERP systems can support centralized business processes, such as accounting and human resource management, but fall short of enhancing the work tasks of end users (Beekhuyzen 2001; Steinbrenner 2001; von Hellens, Nielsen et al. 2005). This study reconfirms the study by **Wagner and Newell** (2004) in their claim of the failure of vendors to understand that the industry "best practices" incorporated in the standard configuration of ERP systems may not adequately meet work requirements within the heterogeneous environment of a university. However, their study did not identify what 'really happened' behind the situation. Also, the study had not intended to uncover how the system users would overcome or cope with the problems from using such the enterprise systems.

Thus, it is necessary to have a knowledge base and guidelines to ensure that higher education institutions can carefully implement and manage the institutional impacts which accompany these future changes of large scale

information systems (Fisher 2006). It would be helpful for institutions that hope to take advantage of these developments to know what experience their staff currently have, what their attitudes toward web-based technology are, and what they perceive to be the major barriers to the implementation of this technology (Karl and Catherine 2007). The workarounds themselves offer a blueprint for identifying the information gaps that need to be resolved when considering improvements in an information system, and whom to involve in making decision concerning the implementation and use of such systems (Petrides, McClelland et al. 2004). Therefore, an in-depth understanding of IS usage is critical to the decision-making of organizations regarding future systems implementation. Through a single case study, directed at uncovering rich information about user perceptions of SAMS, such an understanding has been established.

LIMITATIONS OF THIS STUDY AND DIRECTIONS FOR FUTURE RESEARCH

Although there is the limitation of a single case study in this paper, the research project aims to expand the analyses to include additional case studies of SAMS usage to enable comparison of user perceptions and enhancing an in-depth understanding. In fact, this research is part of an on-going PhD project aimed at the development of a relevant theory regarding the use of SAMS in universities through the application of the *grounded theory* approach, which is why no theoretical explanations had emerged at the time of writing this paper. Future research would include the additional of data set from the other groups of systems usage such as: direct observation method to explore and obtain deeply understanding of how the user groups perceive to systems usage when user employs the systems. In addition, theoretical sampling between case study can be applied to make the research more valid and precisely of the understanding.

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