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management informations systems use in higher education environments

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MANAGEMENT INFORMATION SYSTEMS USE IN HIGHER EDUCATION ENVIRONMENTS

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ABSTRACT

Although South African higher education institutions continue to invest heavily in IT and information systems; much of this systems are underutilised. The research aims to investigate the utilization of the management information systems (MIS). MIS in higher education have been adopted to input and output relevant information as well as to manage an institutional decision making effectively. That is, the management information systems provide information that is important to making business decisions for the institution. To help understand the utilization of the MISs, the Unified theory of acceptance and use of technology (UTAUT) and the contingency theory are used as lenses to support the study. Users', fit, system, management and organisational characteristics are some of the constructs informing the research model. The use of MIS will be understood through interviews and closed ended questionnaires that will be distributed to users in higher education institutions in South Africa, particularly within the Gauteng province. . The findings from the study will inform a conceptual model for the use of MIS in higher education environment. The paper envisages that the conceptual model will be of significant value.

Keywords

MIS, performance, effort expectancy, higher education, utilization, use, UTAUT, contingency theory

INTRODUCTION

Institutions of higher learning are often resource constrained, with government funding decreasing (Gill and Battacharjee, 2009). Many higher education institutions are now considering alternative revenue streams which put a high demand on information (Rainer and Watson 2012). With such high pressure on information to support its knowledge workers and subsequent investment; there are concerns associated with this information being provided by organisations of higher learning to their employees. Some of these questions are whether if these investments in information to manage an organisation effectively are making a difference. If they are, how are they making a difference (Pande, 2010)? These questions may arise as technology is adopted to give support to users in their tasks within an organisation; this research is undertaken to reveal answers to some of the questions posited above.

MIS have been developed to be participative and anticipative. Besides technology use; MIS have been adopted to support its users in their primary tasks (Gill and Battacharjee, 2009). MIS are tools implemented for users to achieve goals that are important to their lives, jobs and work and can be defined as integrated, user-machine systems for providing information to support operations, management, analysis and decision-making function in an organisation (Friedman and Hoffman, 2001). MIS in this context are intranets put in place to support employees in their daily tasks in higher education environments.

Institutions of higher education traditionally are places where information is accumulated and distributed; it's an intellectual environment where knowledge and people who carry the knowledge circulate (Sagitova, 2012). MIS's implemented within the higher education setting support teachers, researchers, administrators and to automate and control the entire educational process.

The research paper is organised as follows: the problem statement is discussed, followed by the purpose of the study, theoretical foundations, South African higher education landscape is looked into, theories underpinning the research, and the model is looked at, methodology and lastly the conclusion.

SOUTH AFRICAN HIGHER EDUCATION LANDSCAPE

The year 2004 was when public higher education in South Africa underwent major changes; universities of technologies and comprehensive universities were introduced in favour of "technikons" (Higher education monitor, 2009). This meant that employees, systems, processes, management, students and physical structures from various higher education

institutions came together to function as single units. This meant that the South African government had to invest large sums of money in ICT in order to improve administrative functionalities. With such huge investments on IT, creating and understanding conditions for IT to be optimally utilised within the human organisation remain a top priority amongst IT researchers (Doll et al., 1998). User acceptance and usage of IT are crucial factors in determining information system success since systems that are not used are valueless (Mathieson et al., 2001).

PROBLEM STATEMENT

The challenge faced by higher institutions that have implemented MIS about post implementation; there is no evidence on how the users are using the information system (Franco, 2010). System use determines the success of the MIS implemented within the environment (Marchewka et al, 2007).There are changes in both the internal and external environments, the changes causes the system to be unstable. When these changes occur; are strategies that are affected by these changes revised, are hardware and software changes addressed to accommodate the changes in the external and internal environments? Besides information delivery; efforts to integrate the changes into the MIS needs to be looked into.

The research is relevant for policy makers as it will provide an understanding on how the MIS could support its users and accommodate for both internal and external changes. For managers; the research is relevant as it will assist in directing IT investment within the organization, and for academia it's significance lies in that it provides an insight on how MIS can be used to give academics the support they require in assisting the university to achieve its goals, visions and missions.

PURPOSE OF THE STUDY

The purpose of this study is to determine MIS use in higher educational institutions, how different groups of users use the system. To achieve this, the study intends to modify The Unified Theory of Acceptance and Use of Technology (UTAUT) and by incorporating contingency theory variables to formulate a research model.

THEORIES UNDERPINNING THE STUDY

The study is underpinned by two theories; the unified theory of acceptance and use of technology (UTAUT) and MIS contingency theory. UTAUT is made up of eight original models and theories of individual acceptance that were fused together to make up the current one; they include Theory of reasoned action (TRA), technology acceptance model (TAM), motivational model (MM), theory of planned behaviour (TPB), model combining technology acceptance model and theory of planned behaviour (C-TAM-TPB), model of PC utilization (MPCU), Innovation diffusion theory (IDT), and social cognitive theory (SCT). UTAUT has been empirically tested and found to outperform the eight individual models, including the TAM model, from which UTAUT evolved from (Carlsson et al., 2006). Venkatesh et al. (2003) organised the constructs that have been empirically tested as explanatory from previous literature and proposed the UTAUT model, as presented in figure 1.

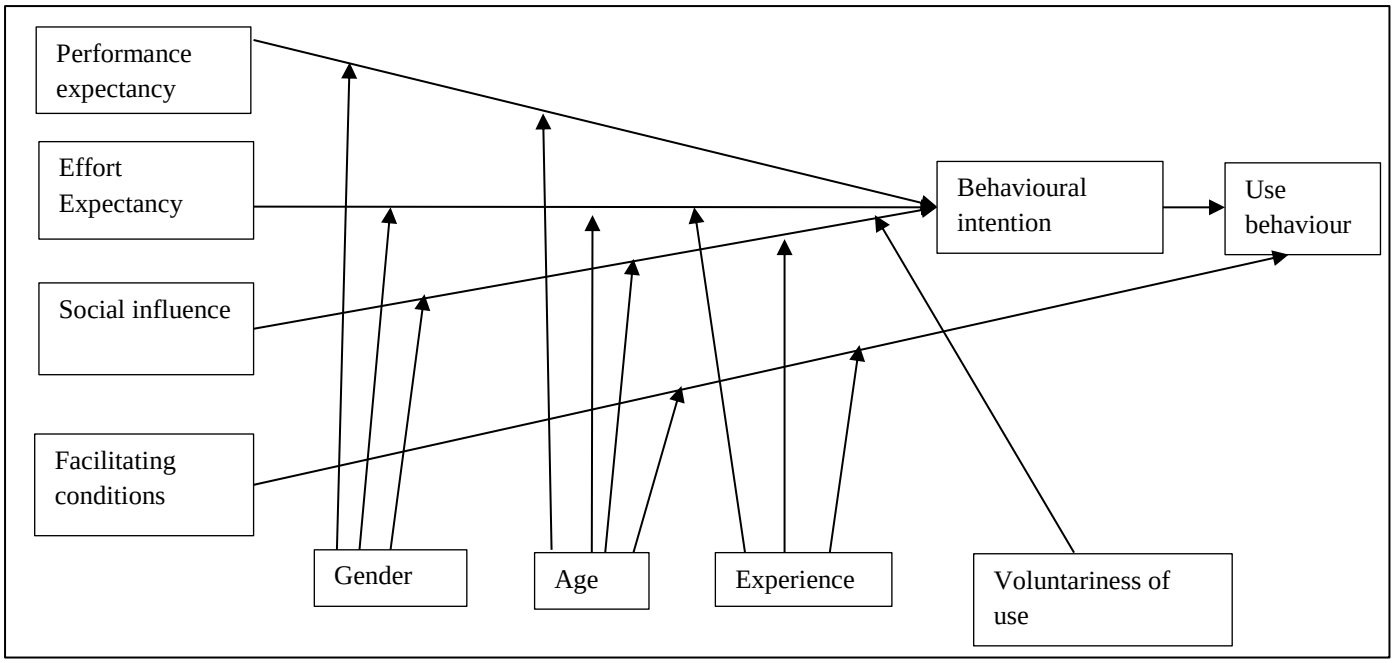

Figure 1: UTAUT model (Venkatesh et al., 2003)

Contingency theory according to Islam and Hu (2012) is an approach to the study of organisational behaviour in which explanations are given as to how dependent factors such as technology, culture and the external environment influence the design and functions of an organisation. Figure 2 below is a representation of contingency model in MIS research

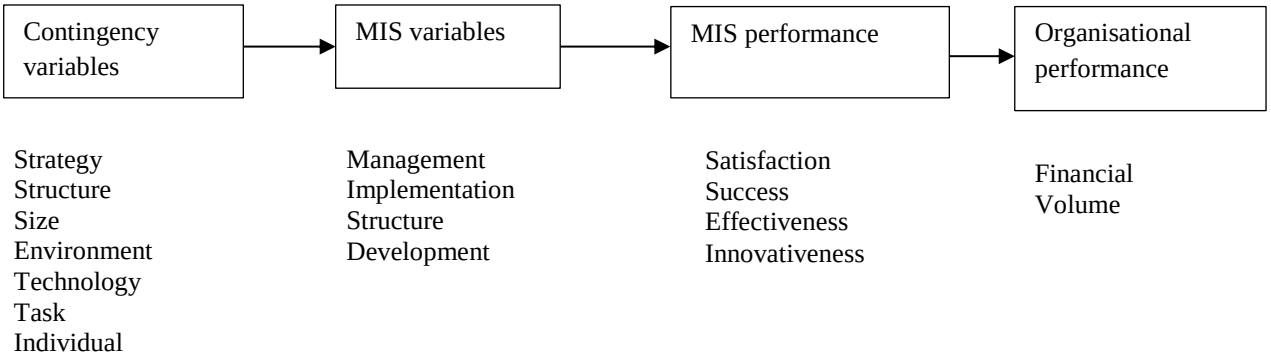

Figure 2: MIS research contingency model (Weill and Olson, 1989)

RESEARCH METHOD

The research will be conducted using a survey questionnaire that will be sent to employees in higher education institutions in South Africa, these will include traditional universities, universities of technology and Further Education Training (FET) colleges around Gauteng province. They are chosen based on judgemental sampling, this is to allow the researcher to use own judgement on whom to include in the sampling. A five point Likert scale from 5-1; with 5-strongly agree, 4-agree, 3- neutral, 2-disagree and 1-strongly disagree will be used to answer questions on the questionnaire. Semi structured interviews will be conducted to further understand how the users use the MIS. The questionnaire will be distributed online using a web based survey tool. A pilot study will be sent out before the questionnaire is distributed. This is to ensure consistency among questions, biases, eliminate errors, improve structure and determine filling out time. Descriptive analysis will be used. The reliability of the model will be tested using Cronbach Alpha Coefficient. The correction of constructs will be carried out to establish the relationships that exist between constructs. Regression analysis will be used to measure the relationship between dependent and independent variables

RESEARH MODEL

The model is developed underpinned by the two theories mentioned above. Users' characteristics which has the following constructs: subjective norm, personal innovativeness in the information technology (PIIT) and computer self-efficacy. Fit characteristics are made up of task relevance and task-technology fit constructs. System characteristics consist of system, information and service quality constructs. Management characteristics are made up of management structure and management support. Organisational characteristics include organisational culture, training, and IT strategy. MIS performance expectancy and effort expectancy influence behavioural intention which in determines MIS use behavior. The dependent variables were identified as users' characteristics (US), fit characteristics (FC), system characteristics (SC), management characteristics (MC) and organisational characteristics (OC). Independent variables are intention and effort to use the system (IEU)

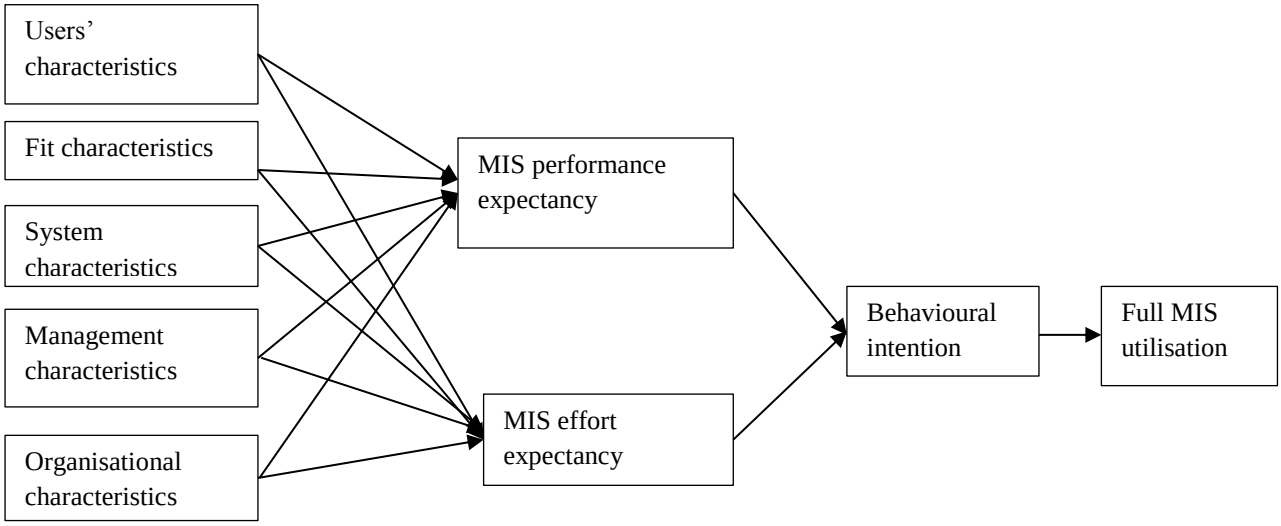

Figure 3: The research model for studying MIS use in higher education environment

STUDY HYPOTHESES

The section below describes the study hypotheses.

Users' characteristics hypotheses

Behavioural intention, performance expectancy and use behaviour of MIS may to some extent be influenced by the individual characteristics of its users Venkatesh and Davis (2000). The following user characteristics will be investigated: subjective norms, personal innovativeness in the IT domain and computer self-efficacy. Therefore it was hypothesised that:

H1: Users' characteristics positively influence MIS performance expectancy

H2: Users' characteristics positively influences MIS effort expectancy

Fit characteristics hypotheses

A technology to performance model that was proposed by Goodhue and Thompson (1995) suggested that there is direct link between task and technology and how users use the technology based on how they perceive it. The following fit characteristics will be investigated; task relevance and task technology fit. Therefore it was hypothesised that:

H3: Fit characteristics positively influence MIS performance expectancy

H4: Fit characteristics positively influence MIS effort expectancy

System characteristics hypotheses

System characteristics such as information quality, system quality, and service quality according to DeLone and McLean (2003) affect the acceptance and use of information systems. Information, system and service quality form part of the system characteristics to be investigated. Therefore it was hypothesised:

H5: System characteristics positively affect MIS performance expectancy

H6: System characteristics positively affect MIS effort expectancy

Management characteristics hypotheses

Management characteristics include management support and IT management structure. Management support influences the way technology is implemented and used in an organisation (Sharma and Yetton, 2003) and IT management which is responsible for planning, organizing, controlling, and directing IT implementation and use play an important role when it comes to end users utilizing a particular IS. Therefore it was hypothesised:

H7: Management characteristics positively affect MIS performance expectancy

H8: Management characteristics positively affect MIS effort expectancy

Organisational characteristics hypotheses

An organization's characteristics such as training on an particular IS, and culture play a role in influencing employee's behaviour including acceptance and use of technology (Chen and Hsiao, 2012). Implementing and using MIS is often a complex issue and organizational issues should be carefully considered when implementing them. Therefore it was hypothesised:

H9: Organisational characteristics positively affect MIS performance expectancy

H10: Organisational characteristics positively affect MIS effort expectancy

Performance expectancy, effort expectancy, Behavioural intention and MIS use behaviour hypothesis

Behavioural intention is a construct created from the TAM and TRA. Behavioural intention leads to usage behaviour (Fishbein and Ajzen, 1975; Avis et al., 1989). The intention to use computers will produce the intended outcome and will directly influence an individuals' use behaviour (Vanketash et al., 2012). MIS Performance expectancy is the degree to which an individual perceives the MIS to be helpful in their job. Performance expectancy has the following sub-constructs; perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectation (Venkatesh et al., 2003). MIS Effort expectancy is the effort required to use the MIS and it has the following sub-constructs; perceived ease of use, complexity and ease of use (Venkatesh et al., 2003). From the above it was hypothesised:

H11: MIS performance expectancy positively affects behavioural intention

H12: MIS effort expectancy positively affects behavioural intention

H13: Behavioural intention positively affects full MIS use. From the hypotheses above the proposed research model was developed as demonstrated in figure 3above.

ENVISAGED CONTRIBUTION OF THE STUDY

The envisaged contribution from this study will assist in understanding how technology is used post-implementation phase in South African higher education environments. The study will assist decision makers in directing investment as it will showcase what areas of MIS users find useful and where can be improvements made.

CONCLUSION

Although South African higher education institutions continue to invest heavily in IT and information systems, there is little evidence to show if any of these systems are utilised. The research aims to investigate the use and utilization of the management information systems (MIS) in higher education. The use of MIS will be studied using interviews and closed ended questionnaires that will be distributed to users in higher education institutions. The findings from the study will inform a conceptual model for the use of MIS in higher education environment. The paper envisages that the conceptual model will add significant value and insight to how management information systems could be utilized in higher education institutions.

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