

Management information system usage and its influence on academic processes in Mount Kenya University, Kigali Campus, Rwanda

Mukuru Ssessazi Alfred¹
mukualfred@yahoo.com

Raymond Wafula Ongus²
raymondongus@gmail.com

Morris Gitonga³
mogits@yahoo.com

Constantine Matoke Nyamboga⁴
constantinenyamboga@gmail.com

¹ Associate Lecturer in Information Science, School of Pure and Applied Sciences, Mount Kenya University Rwanda, P. O. Box 5826, Kigali, Rwanda

² Associate Professor in Information Science, c/o School of Pure & Applied Sciences, Department of Computing and Informatics, Mount Kenya University, Mombasa Campus, MKU Plaza, Nkrumah Road, P.O. Box 42702-80100, Mombasa, Kenya

³ Lecturer in Computing and Informatics, School of Pure and Applied Sciences, Mount Kenya University Rwanda, P. O. Box 5826, Kigali, Rwanda

⁴ Associate Professor in Information Science, School of Pure & Applied Sciences, Department of Computing and Informatics, Mount Kenya University, Nakuru Campus Building, Opposite Valley Hospital, P. O. Box 17273-20100, Nakuru, Kenya

Abstract

The study investigated how both staff and students of Mount Kenya University, Kigali used the university's Management Information System (MIS) to perform and benefit from academic processes and how the functionalities of the MIS influenced the execution of academic processes. Sample size of 164 staff and 354 students were obtained in the case study from target populations of 251 staff and 3072 students respectively, using stratified random and purposive sampling techniques, with the students sampled from the seven schools of the university. A questionnaire was used to collect data from the staff and students, while the Coordinator of ICT and Librarian were interviewed. Findings revealed that the MIS was considered helpful for student registration by staff (89.63%) and students (88.18%); for information retrieval by staff (90.24%) and students (93.66%) respectively; for documents generation by staff (91.46%) and students (86.74%); for enhancing students' awareness of academic programs by the students (95.39%). MIS reduced long queues for services as revealed by staff (92.07%) and students (85.01%). Multiple regression analysis revealed a very strong positive correlation ($R^2 = 0.95$) between MIS usage by staff and perceived effectiveness of implementation of the university's academic processes ($R^2 = 0.95$), and similarly for the students ($R^2 = 0.901$), with both correlations significant at the 95% confidence level. Recommendations of the study included the provision of uninterrupted Internet connectivity with adequate bandwidth to enable readier and faster intranet and Internet access. Provision of training on MIS functionalities for staff should be offered more frequently to minimize inefficiencies in MIS usage. Communications through the MIS should be improved in various ways, including posting timely notifications, providing feedback facilities and providing electronic links to the library's Online Public Access Catalogue other information services, and various published digital documents and learning materials of the university.

Keywords:

Management Information System usage; Academic processes; University students, University staff, Mount Kenya University, Rwanda.

Introduction

Data capturing, processing, storing and retrieving, reporting and managing in universities had traditionally been mainly through manual processes, which is still common in many African universities. The processes tended to be fraught with inconsistencies and inaccuracies because of the usually inconsistent and careless behaviours of the human operators. The methods also resulted in the unreliability of information because it was often not supplied in real time (Talebian *et al.*, 2013). Universities, much like other types of organizations, have been struggling for better performance, effectiveness, and efficiency, which often can only be achieved through skilled human resource and efficient Management Information Systems (MIS). Such MIS should be designed to enhance communication among employees, deliver complex materials throughout the institution, provide an objective system for recording and aggregating information, reduce expenses associated with labour intensive manual activities, and support the organizations strategic goals and direction (Munirat, Isyaka, & Aina, 2014).

Performance management is a systematic process for improving organizational performance by developing the performance of individuals and teams. It is a means of getting better results by understanding and managing performance within an agreed framework of planned goals, standard and competency requirements (Armstrong, 2009). Most organizations and educational institutions are now turning to information technology as an effective tool for monitoring and improving organization's performance (Kitcharoen, 2007). MIS is essentially defined as "*an information system that is developed [or acquired] by an organization to run its management system (comprising management functions, business functions and decision making processes)*" (Jain *et al.*, 2007, p.181). Strathmore University (2011), expounds that MIS are nowadays referred to as management reporting systems (MRS) and that they provide routine information to decision makers to make structured, recurring and routine decisions, such as restocking decisions or bonus awards. They focus on operational efficiency and provide summaries of data. An MRS takes the relatively low data available through a transaction processing system (TPS) and converts it into meaningful aggregated forms that managers need to conduct their respective tasks and responsibilities. O'Brien and Marakas (2009) reiterate that MIS provide information in the form of pre-specified reports and displays to support business decision making activities. Examples include: sales analysis, production performance and cost trend reporting systems. There is existing relationship between the availability and effective use of MIS and staff job performance as argued by Abdulkareem *et al.*, (2012). MIS help to provide the necessary information to make decisions with effectiveness and efficiency in terms of accuracy, comprehensiveness and timeliness. The efficiency of those decisions leads to improved performance (Altaany, 2013).

In Rwanda, the use of information and communication technology (ICT) in education was as far back as the turn of the century considered to be at the heart of the entire education system (Rwanda Ministry of Education, Science, Technology and Scientific Research, 2003). MIS were first introduced in universities such as: University of Rwanda (UR), Kigali Independent University (ULK) and Adventist University of Central Africa (AUCA). MIS modules used included online registration, examination results and timetable. However, some institutions of higher learning lagged behind in the adoption of ICT and continued to invest in labour intensive manual activities, leading to uncertainty in accuracy of information, despite the growth in the number of students, programmes and campuses.

Mount Kenya University is a privately funded tertiary institution headquartered at Thika town, Kenya. It is ISO9001:2008 certified and is a member of the Inter-University Council of East Africa (IUCEA), *inter alia*. The University has established campuses mostly in Kenya. In addition, it provides cross-border delivery of various higher education programmes in its campuses in neighbouring countries such as Rwanda and Somaliland. The campuses in Kenya are: Main Campus Thika, Mombasa Campus, Nairobi Campus, Virtual Campus, Nkubu/Meru Campus, Nakuru Campus, Kisii Campus, Eldoret Campus, Kisumu Centre, Kitale Campus, Lodwar Centre, Kakamega Campus, Kabarnet Campus, and with Hargeisa Campus, Somaliland and Kigali Campus, Rwanda. Mount Kenya University is the leading private University with the largest footprint in terms of the establishment of campuses in East Africa (Mount Kenya University, 2014). Mount Kenya University schools are: Business and Economics, Nursing, Education, Health Science, Pure Applied Sciences, Social Sciences, law, Pharmacy, Medicine, and Postgraduate Studies. Schools' academic programmes are coordinated by coordinators who report to the Principals of Campuses and the Principals report to

Deputy Vice-Chancellors who, in turn, report to the Vice Chancellor, then to the University Council and finally to the Board of Directors (Mount Kenya University, 2015). Mount Kenya University, Kigali Campus in Rwanda, which is the focus of this study, has the following schools: Business and Economics, Pure and Applied Sciences, Nursing, Pharmacy, Health sciences, Education and Social Sciences. These schools are coordinated by coordinators who report to the Principal of Mount Kenya University, Kigali Campus, Rwanda.

In 2014, Mount Kenya University in Kigali, Rwanda found it necessary to implement the University's MIS to address the problems encountered in the existing labor intensive manual activities, including uncertainty in accuracy and delay of information on students attendance evaluation, timetable posting, registration, grading, recording and transmission of marks, notification, and management of finances, monitoring and control of staff performance and generation of documents (I. Gathangi, Personal communication, March 25, 2015). These functionalities were considered to be data processing tasks and documents generation. It was envisaged that that uniformity in executing academic processes, including standardization of teaching, monitoring and evaluation, record keeping, controlling, reporting, efficient information sharing and decision making could be achieved in the short to medium term through a safe, secure, IT networked environment.

Statement of the Problem

Universities that use labour intensive manual activities in carrying out their academic processes, face uncertainties in the accuracy and timeliness of information on students' registration, attendance recording and evaluation, recording and grading of marks, notification. Also monitoring and control of staff performance, management finances and generation of documents are usually cumbersome, time consuming and costly. The development of an Education Management Information System (EMIS) is usually considered a solution to these challenges. Nevertheless, EMIS involved nurturing a new management culture more than establishing a data and information system. The process of data collection, integration, analysis and dissemination is important, and so also is the associated improvements in culture of effective data sharing, information use, and organizational management. These associated benefits aided EMIS development (Hua and Herstein, 2003). MIS in higher education have been adopted to facilitate input and output of relevant information, as well as to manage an institutional decision making effectively (Phahlane & Kekwaletswe, 2014).

Similar challenges led Mount Kenya University to put in place a management information system to benefit its academic processes (I. Gathangi, Personal communication, March 25, 2015). Before the MIS, there was an exponential increase in the costs of the labour intensive manual activities, uncertainties in the accuracy and timeliness of information processing and delivery to decision makers, persistent complaints by both staff and students of errors in the processed data, resulting in inconsistencies and misapplication of the rules, policies and procedures of the university. This often caused disputes and delays in various academic processes, delays in graduation processes and so on. However, even after the deployment of the fairly versatile MIS, it was noticed that some staff still opted to manually process some data.

In Rwanda, there was a dearth of studies done on MIS usage in the universities, particularly concerning the execution of university academic processes. The identified gap is the lack of knowledge of the influence of using Management information system on the execution of academic processes. This research therefore sought to assess the effect of the MIS on the execution of academic processes in the university, using Mount Kenya University, Kigali Campus, Rwanda as case study. It was hoped that this study would be the precursor to similar studies in other universities and higher learning institutions in Rwanda.

Research Objectives

The general objective was assessment of the effects of Management Information System on the execution of academic processes in Mount Kenya University, Kigali campus, Rwanda. The specific objectives of study were to: (i) to determine how staff used the MIS to execute academic processes at Mount Kenya University, Kigali Campus, Rwanda; (ii) determine how students used the MIS to benefit from academic processes at the Campus, Rwanda; and (iii) determine how usage of MIS by both the staff and students affected the implementation of academic processes at the Campus.

Relevant theories

The Information System Success Model proposed by DeLone & McLean (1992) consisted of six interrelated dimensions of information system success: information quality, system quality, service quality, which affect intention to use, user satisfaction, and net benefits. The model proposes that as a result of using an information system characterized by these qualities, certain benefits would be achieved, and the net benefits would influence user satisfaction and the further use of the system. In addition, various Technology Acceptance Models, and the Unified Theory of Acceptance and Use of Technology (UTAUT) explain how users accept, adopt or use to use MIS (Davis, Bagozzi & Warshaw, 1989). Technology Acceptance Models 1, 2 and 3 suggest factors that can influence users to accept a system (Venkatesh & Davis, 2000). UTAUT provides a useful tool for managers needing to assess the likelihood of success for new technology introductions. It helps managers to understand the drivers of acceptance in order to proactively design interventions (including training, marketing, etc.) targeted at populations of users that may be less inclined to adopt and use new systems (Venkatesh *et al*, 2003).

Management Information System at Mount Kenya University

The MIS of Mount Kenya University has students and staff as the principal actors. Staff can input data and both students and staff can retrieve information like statements of marks, notifications, clearance, student cards and fee accounts. Other staff, such as the school coordinators or deans can also retrieve some information like timetables and lecture times and rooms to support their lecturer supervision functions. Student admissions and examinations processing can be coordinated through the MIS, enabling relevant staff to generate the required reports whenever required. The Quality Assurance Directorate is also enabled to download assessment sheets for evaluation of lecturers and student attendances. These data access and reporting scenarios are diagrammed in Figure 1.

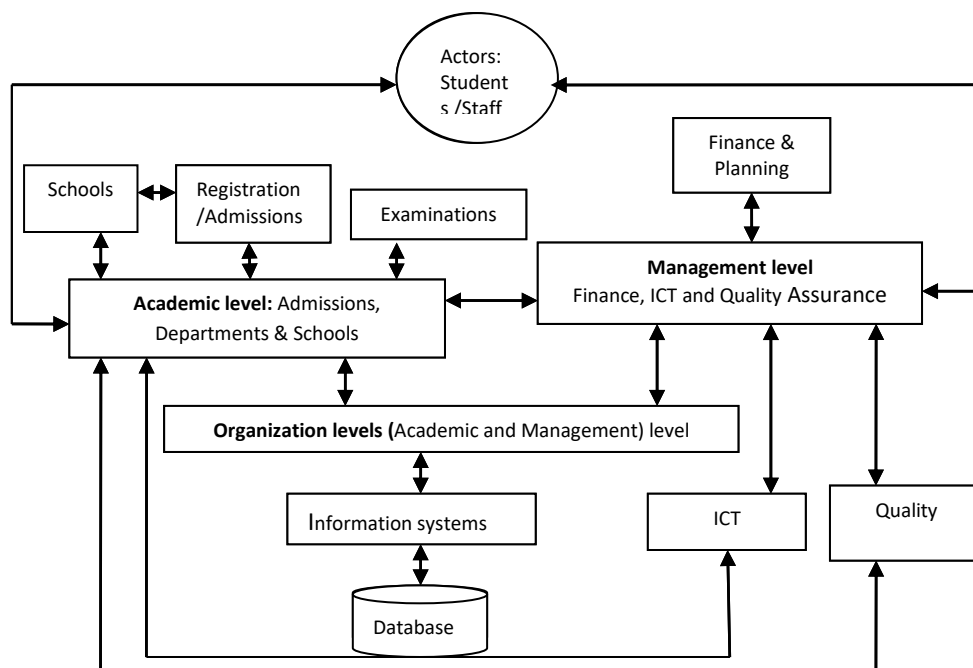


Figure 1: Data access and reporting actors, processes and links at Mount Kenya University
 Source: (I. Gathangi, Personal communication, March 25, 2015)

Conceptual Framework

A conceptual framework of the study is shown in Figure 2, which was developed through a data flow analysis of the academic processes, management functions, organization policies and culture and management style. The framework shows the relationship between the independent and dependent variables of interest in the study. The independent variables involved the various MIS functionalities used by staff and students which in turn affect the implementation of academic processes. The dependent variable was the implementation of university academic processes like

admission, teaching, learning and examination processing. All these were measured using the data collection instruments developed for the study.

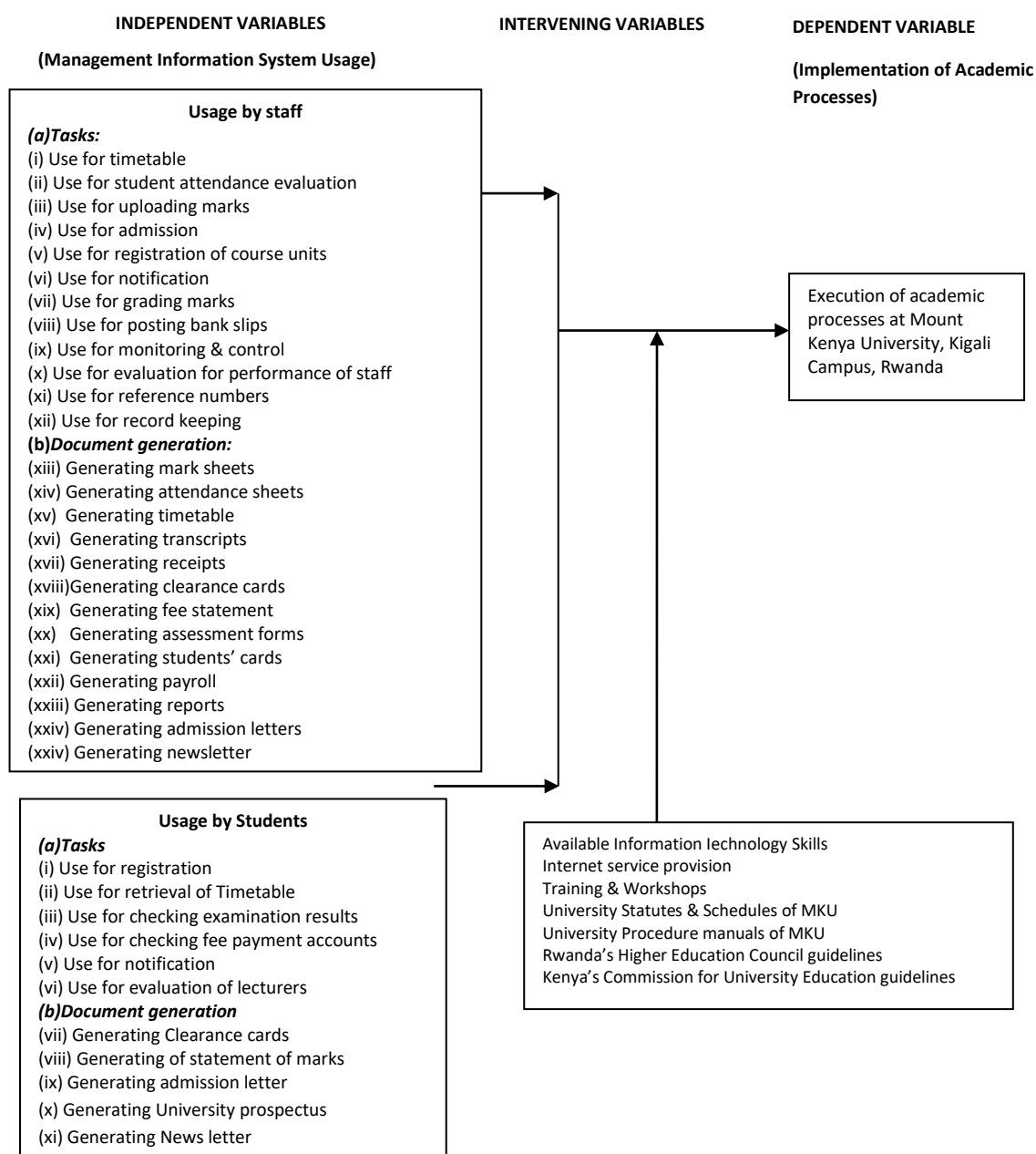


Figure 2: Conceptual Framework
(Source: Mukuru, 2015)

Research Methodology

Research methodology encompass a comprehensive description of the research design, target population, sample size, sampling technique, data collection methods, data collection instruments, administration of data collection instruments, data analysis, *inter alia*.

Research Design

Study employed a case study research design. A case study involved field research which gave deeper description and analysis of study problem (the case), rather than studying a sample of many such cases with the aim of explicitly generalizing findings about the sample to a large population (Brecher & Harvey, 2002). The MIS deployed at the Mount Kenya University, Kigali Campus, Rwanda, was the case in focus.

Target populations and samples

Target population at the Campus from January 2014 to April 2015 was distributed as follows: total numbers of staff and students were 251 and 3072, respectively. The 251 staff comprised 40 full time teaching staff, 187 part time teaching staff, 9 admissions staff, 7 staff in charge of finance, 3 staff in charge of examinations, 2 staff in charge of quality assurance, and 3 staff in charge of teaching programs (F. Mwangi, Personal communication, March 15, 2015). The student population was distributed among the various schools as follow: 826 students from School of Education (826); School of Pure and Applied Sciences (483); School of Social Sciences (246); School of Health Sciences (492); School of Business and Economics (786); School of Pharmacy (125); School of Nursing (114). (R. W. Ongus, Personal communication, March 11, 2015).

The sample sizes for both the staff and students were determined using Yamane's (1967) simplified formula for determining sample size:

$$n = \frac{N}{1 + N * e^2}$$

N = Sample size

N=Total population

e =Error margin (a statistic expressing the amount of random sampling error in a survey's results (0.05). The sample sizes of 164 staff and 354 students were selected by employing the simple random sampling technique, for the staff and purposive sampling technique, for the students, respectively.

Findings and Discussion

Findings showed that, 51.87% of the respondents used the MIS many times a day while the next largest proportion (47.84%) of the respondents used the MIS several times a week.

MIS usage by staff in carrying out academic processes

The staff gave their views on how they used the University's MIS functionalities to support their execution of various academic processes (Table 1).

The main findings from Table 1 are as follow:

- (i) *Faster registration:* MIS was used for registration and made registration faster as indicated by weighted mean of 4.83 and standard deviation 0.633. This meant that the respondents were somewhat divergent in their opinions, although the majority of opinions were either strongly agree or agree.
- (ii) *Retrieval of required information:* That MIS was used much for retrieval of required information as indicated by weighted mean of 4.88 and standard deviation 0.426. This meant that the respondents' views were crowded around the weighted mean, signifying high unanimity in that regard. Also, the majority of opinions were either strongly agree or agree.
- (iii) *Document generation:* MIS was used for document generation as indicated by weighted mean of 4.87 and standard deviation 0.489. This meant that the respondents' views were crowded around the weighted mean, signifying unanimity in that regard. The majority of opinions were either strongly agree or agree.

- (iv) *Reduction of queues for services:* MIS was used to reduce long queues for services as indicated by weighted mean of 4.87 and standard deviation 0.514. This meant that the respondents were somewhat divergent in their opinions, although the majority of them strongly agreed or agreed.
- (v) *Option to elicit feedback by staff:* MIS was used for option to elicit feedback from staff, as indicated by weighted mean of 4.27 and standard deviation 1.178. This meant that the respondents were somewhat divergent in their opinions, although the majority of opinions were either strongly agree or agree.
- (vi) *Library's Electronic Information Resources:* MIS was connected to electronic library as indicated by weighted mean of 4.23 and standard deviation 1.175. This meant that the respondents were somewhat divergent in their opinions, although the majority of opinions were either strongly agree or agree.
- (vii) *Online Lecture Notes:* MIS was not used to access lecture notes as indicated by weighted mean of 1.87 and standard deviation 0.756. This meant that respondents were dispersed from the weighted mean. The majority of them disagreed or strongly disagreed.
- (viii) *Audio & Video Streaming of Lectures:* MIS was not used for audio and video streaming of lectures as indicated by weighted mean of 1.75 and standard deviation 0.896. This meant that respondents were dispersed from the weighted mean in this regard. The majority of them either disagreed or strongly disagreed.

Table 1: Execution of Academic Processes by staff using Management Information System

Effect	N	Strongly Agree 5	Agree 4	Not sure 3	Disagree 2	Strongly Disagree 1	Weighted Mean	Std. Dev.
Faster Registration	164	147 (89.63%)	13 (7.93%)	0 (0%)	1 (0.610%)	3 (1.83%)	4.83	0.633
Retrieval of required information	164	148 (90.24%)	14 (8.54%)	0 (0%)	2 (1.22%)	0 (0%)	4.88	0.426
Document generation	164	150 (91.46%)	8 (4.88%)	4 (2.44%)	2 (1.22%)	0 (0%)	4.87	0.489
Reduction of queues	164	151 (92.07%)	9 (5.49%)	0 (0%)	4 (2.44%)	0 (0%)	4.87	0.514
Feedback	164	102 (62.20%)	31 (18.90%)	16 (9.80%)	3 (1.83%)	12 (7.32%)	4.27	1.178
Audio streams	164	1 (0.61%)	4 (2.44%)	32 (19.51%)	43 (26.22%)	84 (51.22%)	1.75	0.896
Library's Electronic Information Resources	164	99 (60.37%)	36 (21.95%)	2 (1.22%)	22 (13.41%)	5 (3.05%)	4.23	1.175
Lecture Notes	164	2 (1.22%)	6 (3.66%)	7 (4.27%)	102 (62.20%)	47 (28.66%)	1.87	0.756

(SD <0.5 or close to zero – Unanimity: Respondents views were crowded around the weighted mean)

(SD >0.5 or high – Divergent opinions: Respondents views were dispersed from the weighted mean)

Source: Primary data

MIS usage by students in carrying out academic processes

In Table 2 students gave their views on how they used the University's MIS functionalities with respect to the execution of various academic processes.

The findings from Table 2 showed that: *Faster Registration, Retrieval of Required Information, Document Generation, Awareness of University Programmes, Reduction of Queuing for Services* all had high weighted means, signifying that the students derived these benefits from their use of the MIS, even though the responses were dispersed from the mean, thereby indicating a lack of unanimity. However, the most of the students indicated lack of or minimal benefits from *Options to Elicit Feedback by Students, Audio Streaming of Lectures, Library's Electronic Information Resources*, and *Access to Lecture Notes*, all of which were not really available for usage by students, as confirmed by the low weighted means of the responses. Standard deviations of less than 0.5 for each of these attributes meant that the respondents' views were crowded around the weighted mean and therefore unanimous.

Table 2: Execution of Academic Processes by staff using Management Information System

Effect	N	Strongly Agree 5	Agree 4	Not sure 3	Disagree 2	Strongly Disagree 1	Weighted mean	Std. Dev.
Faster Registration	347	306 (88.18%)	25 (7.20%)	8 (2.31%)	5 (1.44%)	3 (0.86%)	4.80	0.629
Required information	347	325 (93.66%)	8 (2.31%)	0 (0%)	12 (3.46%)	2 (0.58%)	4.85	0.637
Document generation	347	301 (86.74%)	30 (8.65%)	12 (3.46%)	4 (1.15%)	0 (0%)	4.80	0.608
Awareness of University Programmes	347	331 (95.39%)	11 (3.17%)	2 (0.58%)	3 (0.86%)	0 (0%)	4.93	0.358
Reduction of queues	347	295 (85.01%)	49 (14.12%)	0 (0%)	1 (0.29%)	2 (0.57%)	4.83	0.480
Feedback	347	33 (9.51%)	59 (17.00%)	108 (31.12%)	64 (18.44%)	83 (23.92%)	2.70	1.267
Audio & Video streams	347	0 (0%)	0 (0%)	203 (58.50%)	98 (28.24%)	46 (13.26%)	2.45	0.717
Library's Electronic Information Resources	347	0 (0%)	40 (11.53%)	66 (19.02%)	53 (15.27%)	188 (54.18%)	1.88	1.087
Lecture Notes	347	0 (0%)	12 (3.46%)	0 (0%)	298 (85.88%)	37 (10.66%)	1.96	0.494

(SD <0.5 or close to zero – Unanimity: Respondents views were crowded around the weighted mean)

(SD >0.5 or high – Divergent opinions: Respondents views were dispersed from the weighted mean)

Source: Primary data

How has the Usage of Management Information System affected Execution of Academic Processes?

This question was answered through analysis of two multiple regression models to understand the strength and direction of linear correlation relationships between extent of MIS usage (independent variable) and perceived effectiveness of execution of academic processes (predictor variable) by the sampled staff and students respectively.

(a) Influence of MIS usage by Staff

The values of the Usage of MIS functionality variable was computed as the average of the responses by the sampled staff on the use of the following MIS supported *tasks* (admission, course units registration, timetable and workload, uploading of marks, grading of marks, students' attendance, record keeping, examination results, payment, notification and evaluation, monitoring, evaluate performance of lecturers, posting bank slips, generate fee accounts, reference numbers, generate evaluation forms) and *documents generation* (mark sheets, attendance sheet, timetable, students cards, clearance card, receipts, fee statement, payroll, statement of marks, reports generation, evaluation

forms generation, admission letter, University prospectus and newsletter. These tasks and documents generation are performed exclusively by staff members.

Accordingly to the data summarized in Table 3(a) and (b), the multiple linear regression stochastic model for analysing the influence of the predictor variable on the independent variable among the sampled staff showed a very strong positive correlation ($R = .977$, $R^2 = .955$), which was also significant at the 95% confidence interval. The value of the coefficient of determination (R^2) meant that 95.5% of total variations in execution of academic processes by the staff could be explained by the stochastic multiple linear regression model, while the remaining variation of 4.5% was due to unexplained factors. The estimated linear model from the above analysis that can be used for predictive purposes is therefore:

$Y = b_0 + b_1X_1 + b_2X_2 + \epsilon$, which, with $b_0 = -0.136$, $b_1 = 0.126$, $b_2 = 0.904$ and $\epsilon = 0.321$, as provided in Table 3 becomes:

$Y = -0.136 + 0.126X_1 + 0.904X_2 + 0.321$, where Y is implementation of academic processes by staff, X_1 is use of MIS functionalities for tasks by staff, X_2 is use of MIS functionalities for document generation by staff, the ϵ is the error term.

Table 3(a): Multiple Regression Model Results - Staff

Model	b	Std. Error	Sig.
(Constant)	-0.136	0.076	0.072
Tasks	0.126	0.031	0.000
Document generation	0.904	0.033	0.000

Dependent variable: Implementation of academic processes by staff

Source: Primary data

Table 3(b): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.977 ^a	0.955	0.954	0.321

Predictors: (Constant), Usage of MIS for tasks by staff, Usage of MIS for document generation by staff

Source: Primary data

(b) Influence of MIS usage by Students

The values of the Usage of MIS functionality variable was computed as the average of the responses by the sampled students on the use of MIS for the following tasks (registration, timetable, examination results, payment, notification and evaluation), and documents generation (clearance card, statement of marks, admission letter, prospectus book and newsletter). These tasks and documents generation are performed exclusively by the students.

Accordingly to the data summarized in Table 4(a) and (b), the multiple linear regression stochastic model for analysing the influence of the predictor variable on the independent variable among the sampled staff showed a very strong positive correlation ($R = .901$, $R^2 = .812$), which was also significant at the 95% confidence interval. The value of the coefficient of determination (R^2) meant that 81.2% of total variations in execution of academic processes by the staff could be explained by the stochastic multiple linear regression model, while the remaining variation of 18.8% was due to unexplained factors. Therefore, the estimated multiple linear model from the above analysis that may be used for predictive purposes is:

$Y = b_0 + b_1X + b_2X + \epsilon$, which, with $b_0 = -1.330$, $b_1 = 0.576$, $b_2 = 0.757$ and $\epsilon = 0.656$, as provided in Table 4 becomes:

$Y = -1.330 + 0.576X_1 + 0.757X_2 + 0.656$, where Y is implementation of academic processes by students, X_1 is use of MIS functionalities for tasks by students, X_2 is use of MIS functionalities for document generation by students, the ϵ is the error term.

Findings from the interviews

The respondents who were interviewed included the ICT Coordinator and the Campus Librarian. The respondents gave candid responses to the questions posed using a designed interview guide. In

particular, the interviewees suggested better functionality of MIS along with its integration with open source software such as KOHA, as well as unfettered supply of the Internet in order to end inconveniences and reduce complaints from users.

Table 4(a): Multiple Regression Model Results - Students

Model	b	Std. Error	Sig.
(Constant)	-1.330	0.234	0.000
Tasks	0.576	0.059	0.000
Document generation	0.757	0.031	0.000

Dependent variable: Implementation of academic processes by students

Source: Primary data

Table 4(b): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.901 ^a	0.812	0.811	0.656

Predictor: (Constant), Usage of MIS for Tasks, Usage of MIS for Document Generation

Source: Primary data

Summary of the findings

Management Information System Usage by Staff in Academic Processes: Findings from quantitative analysis and qualitative analysis showed that staff benefited from being able to perform academic tasks and generate relevant documents. Respondents indicated that MIS has reduced manual work, reduced long queuing for services and made document generation and keeping records easy and faster but cited that MIS slows down whenever Internet downtimes were experienced.

Management Information System Usage by Students in Academic Processes: Findings showed that students benefited from tasks and document generation; registration was done easily, timetables, examination results, fee account checking features were accessed, used for notification, generating of clearance cards, in generation of statement of marks and in evaluation of lectures' performance. From qualitative analysis, respondents confirmed that MIS has helped in easy registration of course units, checking of examination marks, checking of fee payment accounts and reduced long queuing for services, and facilitated in generation of clearance cards and statement of marks. Students mentioned however that the MIS slows down whenever there was an Internet access problem.

How Management Information System affected Execution of Academic Processes: The multiple regression analyses showed a multiple correlation coefficient (R) of 0.977 for the relationship between MIS usage by staff and effectiveness of implementation of academic processes, which indicates a very strong and positive relationship. The multiple correlation coefficient of the relationship between MIS usage by students and their perceived effectiveness of their implementation of academic processes is 0.901, which also indicates a very strong and positive relationship. The correlations were found to be statistically significant in both cases.

Conclusion

The study found out that the MIS at Mount Kenya University was used to upload examination results, record keeping, generating transcripts, and report, monitoring teaching programs and evaluation of performance of lecturers, generation of fee payment accounts and receipts respectively. MIS usage facilitated online assessment of students' attendance, and in preparing mark sheets. It was very helpful in the generation of admission letters, registration and issuance of student cards, production of clearance cards and academic transcripts. The systems also helped in the generation of staff assessments and evaluation of staff performance. The MIS also reduced length of queues for services. MIS functionalities also benefitted students in the complying with various university academic requirements and access to documents and information, including registration, accessibility to examination results, fee payments and account checking, and awareness of the University programmes. It reduced or eliminated long queues for services. From the two multiple regressions run, it was determined that there were indeed very strong, positive, multiple correlations between the

usage of MIS (independent variable) and the implementation of academic processes by staff and students (dependent variable) at the Mount Kenya University, Kigali Campus, Rwanda.

Recommendations

The study recommends that:

- i) The University management should provide uninterrupted Internet connectivity to avert unnecessary inconveniences to MIS usage by users.
 - ii) The University management should provide adequate training usage of various obscure MIS functionalities in order to improve usage of the systems.
 - iii) The MIS developers should improve the communication capabilities via MIS, by improving the notifications and interactive capabilities of the system.
 - iv) The MIS developers should enable an electronic link to the Library's electronic content and online public access catalogue via the KOHA open source software. This would enable users to access materials such as the electronic newsletter, electronic version of the University prospectus, and streaming audio and video teaching and learning materials.
 - v) The MIS developers should provide the capacity to download electronic lecture notes and upload assignments as and when needed.
- i) A study should be carried out on causes of performance failures of various MIS functionalities solutions provided.
 - ii) The MIS need to be upgraded to enhance its security features and the provision of better functionalities for notifications and feedback.
 - iii) A more general study should be carried out to understand the usage of MIS in other Universities in Rwanda.

References

- Abdulkareem, A. Y., Alabi, A. T., Fashiku, C. O. & Akinnubi, O. P. (2012). Management Information System and Senior Staff Job Performance in Polytechnics. *Journal of Education and Practice*, 3(5). Retrieved on October 05, 2014 from <http://issuu.com/alexanderdecker/docs/11.management-information-system-and-senior-staff>
- Altaany, H. F. (2013). Impact of management information systems to improve performance in municipalities in North of Jordan. *Interdisciplinary Journal of Contemporary Research in Business*, 5(6), 433. Retrieved on February 08, 2015 from <http://journalarchievs36.webs.com/429-446.pdf>
- Armstrong, M. (2009). *Armstrong's handbook of performance management: Evidence based guide to delivering high performance* (4th ed.). Kundli, India: Replika press.
- Brecher, M., & Harvey, F. P. (2002). *Evaluating Methodology in International Studies*. Michigan, USA: University of Michigan press. Retrieved on March 17, 2015 from <http://www.bibliovault.org/BV.book.epl%3FI...>
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 1(35), 982- 1003. Retrieved on February 01, 2015 from <http://www.vvenkatesh.com/IT/Abstract/14.asp>
- DeLone W. & McLean, E. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*. 3(1), 60–95.
- Hua, H., & Herstein, J. (2003). Education management information system (EMIS): Integrated data and information systems and their implications in Educational management. Paper presented at the Conference of Comparative and International Education Society New Orleans, USA. Retrieved on January 11, 2015 from <http://www.etsd.lib.stu.edu.tw/etdservice/detail?n=3>
- Jain, M, Pillai, V., Singh, S, & Jain, S. (2007). *Structured System Analysis and Design*. 2nd edition. New Delhi: BPB Publications.
- Kitcharoen, S. (2007). Importance-performance analysis on information technology applications in higher educational institutions in Thailand. *ABAC Journal*, 27(2), 15-22. Retrieved on November 9, 2014 from http://journal.au.edu/abac_journal/2007/mayo7mayo7/abacjVo127o2_articale03.pdf
- Mount Kenya University. (2014). *Institution history in Kenya*. Retrieved on February 28, 2015 from <http://www.mku.ac.ke>
- Mount Kenya University. (2015). *Constituent Colleges, Campuses & Centres: Coordination Manual* (2nd Ed.). Thika (Kenya): Author.

- Mukuru, Ssessazi Alfred. (2015). *Management Information System and Execution of Academic Processes: A Case study of Mount Kenya University, Kigali Campus, Rwanda*. Unpublished Masters Thesis (Master of Science in Information Science degree programme). Kigali, Rwanda: Mount Kenya University.
- Munirat, Y., Isyaka, M. S., & Aina, O. K. (2014). Impact of management information system on performance of business organization in Nigeria. *International Journal of Humanities Social Sciences and Education*, 1(2), 76-86.
- O'Brien, J. A. & Marakas, G. M. (2009). *Management Information Systems*. 9th edition. New York: McGraw-Hill Companies, Inc.
- Phahlane, M., & Kekwaletswe, R. (2014, March). Management information systems use in higher education environment. *Proceedings of the Southern Association for information systems conference, Macon, USA*. Retrieved on September 22, 2014 from <http://aisel.air.pdf>.
- Rwanda Ministry of Education, Science, Technology and Scientific Research. (2003). *Education Sector Policy: Policy document*. Retrieved February 8, 2015 from http://www.mineduc.gov.rw/fileadmin/user.../EDUCATION_POLICY.pdf
- Strathmore University. (2011). *Management Information Systems: Study Text*. 2nd Edition. Nairobi: Author.
- Talebian, S., Yahiavi, M., Deghkan, S., & Abasi, A. (2013). Investigation management and information systems. *Interdisciplinary Journal of Contemporary Research in Business*, 4(12), 519-524.
- Venkatesh, V. & Davis, F. D. (2000). A theoretical extension of the Technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186-204. Retrieved on February 01, 2015 from <http://www.vvenkatesh.com/IT/Abstract/14.asp>
- Venkatesh, V., Davis, F. D., Morris, M. G. & Davis, G. B. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27 (3), 425-478. Retrieved on February 01, 2015 from <http://www.vvenkatesh.com/IT/Abstract/14.asp>
- Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). New York, USA: Harper and Row.

Author Profiles

Mukuru Sessaazi Alfred holds MSc. Information Science (ICT option), and is Assistant lecturer at Mount Kenya University's Kigali Campus, Rwanda. He has teaching and supervision experience in lecturing and supervising undergraduate students in the departments of Information Technology and Education. This article is based on the research he carried out on Mount Kenya University's management information system for his MSc (Information Systems) degree.

Raymond Wafula Ongus, PhD is Associate Professor at Mount Kenya University, Mombasa Campus in Kenya, where he teaches in the School of Computing and Informatics. He had worked for four years at Mount Kenya University, Kigali Campus, Rwanda where he once served as Deputy Vice Chancellor-designate. He was also once Senior Assistant Librarian at Egerton University in Kenya, where he was in charge of the J. D. Rockefeller Research Library and its hybrid computer network. He has a PhD in Library and Information Science, M.Sc. In Information Science, and B.Ed. (Science) specialized in pure mathematics and statistics.

Morris Mbaabu Gitonga is an Assistant Lecturer and Acting Head of Department of Information Technology at Mount Kenya University's Rwanda Campus. He has a bachelor's degree in Mathematics and Statistics and a master's degree in Computer Science.

Constantine Matoke Nyamboga, PhD is an Associate Professor at Mount Kenya University, Nakuru Campus, Kenya where he teaches in the School of Computing and Informatics. Previously he worked for three years at Kisii University where he founded the Faculty of Information Science and Technology, and has longer experience in the field of Library and Information science at Egerton University in Kenya. He has supervised numerous postgraduate students, and has bachelor's, master's and doctoral degrees in Library and Information science.