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RESEARCH ARTICLE

**CONTENT MANAGEMENT IN INSTITUTIONS OF HIGHER LEARNING: A FOCUS ON MOI
UNIVERSITY, KENYA**

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ABSTRACT

Content management has been reported to pose challenges to institutions of higher learning due to inadequate infrastructure, poor content organisation and management, lack of preservation plans and poor e-content security. This paper is based on a study that examined the types of content generated at Moi University; the strategies for their management and levels of user satisfaction with the strategies. The paper is informed by the OCLC Collections Grid and the Conway Digital Landscape Model. Adopting a mixed method research design, data was collected from a sample of 4 schools at Moi University from which 40% of lecturers, administrators and ICT staff were purposively selected. Key policy makers were interviewed while creators and users of digital content completed questionnaires. The paper concludes that Moi University has implemented information systems but the digital content is ineffectively managed. Therefore there is need to enhance and facilitate the use of this content among users by implementing effective content management strategies. The paper recommends that: the university increases the numbers of computing resources and internet access points in departments, and holds workshops to increase awareness on content management.

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INTRODUCTION

Institutions of higher learning are custodians of intellectual capital for various professions at different levels. As a result, they need to identify effective strategies for capturing and managing these intellectual assets alongside other types of information that they interact with. With the advent of Information and Communication Technology (ICT), authors of different intellectual works, for example researchers, have advanced tools at their disposal to help them put together and present their ideas in better ways. They are facilitated to store these materials and access it more easily than has been the case before these tools were available. Tools such as word processors, data analyzers, presentation graphics and publishing tools among others have enabled individuals and institutions to capture, manipulate, store and retrieve their intellectual works more efficiently. ICT has permeated most institutions of higher learning in Kenya albeit at different levels. These institutions seek ways of integrating these technologies into their day-to-day activities ranging from administration to teaching and learning. In the arena of information capture and management, technological advances have now moved on to Content Management Systems (CMS). Content is generally understood as the subject, idea(s) or story that a piece of writing, or a radio or a television program deals with. It is also any material, such as writing, pictures or music

that appears on a website or CD-ROM. Content can also be defined as everything that is included in a collection and that is held or included in something for example cultural content, proverbs, art, music, etc. (Ndemo, 2008). According to Kashorda and Waema (2007), the use of Information and Communication Technologies (ICT) in higher education institutions has the potential to enhance the quality of teaching and learning, the research productivity of the faculty and students, and the management and effectiveness of institutions. Kenya has already developed policies that articulate the significance of ICT in higher education.

According to Siemens, in Mutula (2008), the term content in literature has generally been used to refer to e-Content such as; e-journals, images, graphics, video, sound, documents, records (e-records), movies, websites, e-government content, online databases, emails, online news and advertisements, software, animations, among others. Besides government, providers of such content to citizenry include, among others: the media, Internet service providers, artists, publishers, mobile phone operators and bloggers. Elsewhere, Mutula (n.d.), defines e-Content as information and knowledge products that are generated, stored, transmitted and retrieved in digital formats. In the context of this paper, content refers to the pieces of information in the organisation (in particular its Web sites, databases and Local Area Networks), and would include theses and dissertations, research papers, lecture notes and presentations, course syllabi, information on structure and duration of academic programs, faculty and administrative

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staff, advertisements and news, electronic communication to name but a few. This content is generated as a result of short-term and long-term activities at the institution and includes the ideas and strategies generated at administrative meetings to plan for the successful running of the institution. Content is also created at academic sessions such as lectures, examinations, presentations, workshops, and conferences. Such content can be regarded as local content which Ballantyne in Mutula (2008) refers to as locally-owned and adapted knowledge. This content may be in print and/or electronic formats and enables people to draw on resources in their immediate neighbourhood making them less dependent on outside supplies, which may be costly, scarce and irregularly available. As Mutula (ibid.) further puts it, local content provides the means of satisfying internal needs, enhances self-reliance, helps bridge intra and extra digital divide, enhances community access to content and in general gives a community identity as it mirrors real life situations and operations.

In the institutions of higher learning in Kenya, digital content exists arising from the intellectual and administrative activities of the faculty members of these institutions. The academic communities in these institutions engage in various pursuits such as research, teaching, and communication that generate content in form of information and knowledge products. As noted by Mutula (2008), activities of public organizations are knowledge intensive and staff engaged are usually highly educated. Such calibre of staff cannot be expected to function properly if they do not have good mechanisms with which to share knowledge across their different units in order to enhance policy-making and service delivery. In the same vein, academic institutions are largely public; to a great extent they also deal in intellectual knowledge and their staff is also highly educated. To manage their information and knowledge, they need to implement effective mechanisms and strategies to ensure adequate flow of information and knowledge between their constituent units and individuals. This will in turn enhance policy-making, improve service delivery and facilitate the institutions' core business. Content management has been reported to pose challenges to institutions and organizations, Moi University included.

Review of Related Literature

Mutula and Wamukoya (2007) state that there are various interpretations of the concepts of data, information and knowledge. In their view, 'data' simply refers to raw facts or observations. According to O'Brien, in Mutula and Wamukoya (2007), data can be defined as facts, events or transactions that have been recorded. Mutula and Wamukoya explain that data can also be regarded as raw material that has no meaning unless it is converted into information by analysis, interpretation and being put into context. Fleming, in Bellinger (2004), observes that a collection of data is not information, a collection of information is not knowledge, a collection of knowledge is not wisdom and a collection of wisdom is not truth. The idea, according to him, is that information, knowledge, and wisdom are more than simply collections. He explains that, on the contrary, the whole represents more than the sum of its parts and has a synergy of its own. According to Bellinger (2004), data is just a meaningless point in space and time without context, thus is without a meaningful relation to

anything else. He explains that when we encounter a piece of data, if it gets our attention at all, our first action is usually to attempt to find a way to attribute meaning to it. He clarifies that we do this by associating it with other things and thereby we create context which, more often than not, is somewhat akin to conjecture, yet it fabricates meaning. Once refined, data can then be regarded as 'information'. The Knowledge Management Glossary in Mutula and Wamukoya (2007) defines information as data organized within a context and translated into a form with structure and meaning. That a collection of data is not information, as Fleming indicated, implies that a collection of data for which there is no relation between the pieces of data is not information. The pieces of data may represent information, yet whether or not it is information depends on the understanding of the one perceiving the data. In summary, information relates to description, definition, or perspective (what, who, when, where) (Bellinger, 2004).

According to the BitPipe Research Guide (2000), data, documents and content are the lifeblood of the business. They carry messages and information as they circulate from department to department, satellite offices to headquarters and from company to supplier. Successful businesses learn to build once and re-use many times. The research guide goes ahead to say that CM is an amalgamation of many different applications with the purpose of leveraging enterprise or companywide knowledge assets for competitive advantage. According to the research guide, the content in question can include, but is not limited to, text documents and memos, spreadsheets, diagrams, Web-based HTML or XML documents, and images, as well as moving video files. These assets may reside within a single department in a single location or in multiple departments throughout the organization. Bitpipe Research Guide (2000) further opines that the key forces that drive businesses to Content Management are the need for collaboration among multiple departments and offices, the need for industrial compliance to regulation and the need for consolidation of organizational data in its different classes.

Content is a key resource of the information economy. Everything has a cost, one way or another. Although often considered to be freely available, McGovern (2001) says that from the free content perspective, the key cost is time. We pay with our time by having to deal with badly organized or badly written content. On the content of websites, Muigai (2008) explains why content is king online. He says that visitors arrive at a website through search engines, online ads, links, and URLs found offline. According to him, search engines are the most efficient and cost effective way to drive visitors to a website. He explains that search engines find information by crawling websites and therefore if content on a website is skimpy or of poor quality, it will not be indexed or will rank low. As he puts it, an organization's website content must be part of its online marketing effort. For an institution of higher learning like Moi University, these guidelines on the quality of good online content are very important. The university, like many other similar institutions, is now turning to online technologies to market its services and programs. It must strive to repeatedly attract visitors to its site. They must also be aided to find the information they are looking for once they are on the site. As has been stated elsewhere, the quality of

academic institutions' content on the web is used to rank them globally (CCHS-CSIC, 2009). Therefore, Moi University cannot afford to be careless about the quality of content it houses on its website. Conway (2008) notes the challenging technology developments that have created nearly ubiquitous digital content on and off the modern university campus and the relentless shift to digital based and tool-rich scholarship within and across disciplinary boundaries. The content landscape at Moi University is highly dynamic and ever growing as the use of ICT at the institution also improves. At the moment most of the units at the institution are using ICT in varying degrees to create, access and use digital content. The academic staff is also increasingly outputting their intellectual material in electronic form. Some of the digital content at Moi University includes digital library materials such as electronic journals, e-books, theses and dissertations, scholarly communication, online course materials (such as course descriptions and syllabi, course modules) and business documents such as internal and external communications. The university maintains a website and some of the mentioned content is accessible via the Internet or on the Local Area Network. These include advertisements and notifications for upcoming and past events, information on academic programs and events, departmental information and other general information.

Mutula and Wamukoya (2007) state that increasingly, corporate organisations are harnessing content to enhance competitiveness and productivity. The authors explain that among other actions, meeting these goals will require creation and sharing of content within organisations by all people, requisite infrastructure for accessing the content, production and dissemination of local content, online education and support, promotion of user-centred methodology in building systems, human resource development strategies, free flow of information and knowledge, using open standards to create and share content and building institutional capacities to collect, organise, store and share information and knowledge. Goodwin, *et al* (2005) recommend that for a big and far-reaching project such as the implementation of a Content Management System, upper level management involvement and support are needed to insure that decisions are made, implemented and communicated. They opine that a project this significant needs direct participation of upper management for authority, subject specialists for content, collection managers for organization, in addition to people who understand the software and its capabilities. In their paper, whose purpose was to describe the systematic implementation of a CMS at Texas A&M Libraries, they found that the effort of developing a unified web presence reveals where the organization itself lacks unity. They recommend that the opportunity could be used to examine what the (library) communicates to its public and how that presents (or does not) a unified organization. They suggest that this is an opportune time to uncover outdated, inaccurate and inconsistent information.

METHODOLOGY

For purposes of the study, the mixed method research paradigm was deemed appropriate since the issues of importance were found to be of both qualitative and quantitative nature. Qualitative issues in the study included

areas where the respondents were given freedom to explain in detail various issues and were captured using open ended questions such as 'What strategies do you have to ensure that the content you create is accessible to your users in the intended format?' and 'How useful do you find the university website as an information source? Briefly comment on your answer.' On the other hand, quantitative issues were captured using closed ended questions where the respondents were required to select responses from a given list. An example is the use of the Likert Scale that was used to measure the degree of satisfaction with the levels of support provided by the university for creation, dissemination, storage and use of digital content. The choices of responses ranged from strongly agree to strongly disagree.

The infostructure and information architecture at Moi University were examined as they are critical in content management. The researcher further carried out a survey of the various functional MIS at the institution to establish the layout of information and how it was organized to make it useful and accessible to its intended users. Of special interest was the Moi University Website on which a content analysis was carried out to examine its organization, access and navigational issues. Document review was carried out to establish the different types of digital content available in the institution. These include the Management Information Systems (MIS), the institutional Website, software such as databases and teaching software, learning objects, courseware, training manuals, research data, theses and dissertations, and journals among others. Because of the technical nature of the study, purposive sampling was preferred. This was used to select specific departments and individuals of Moi University who, as was earlier noted, are directly involved in creation, use and organization of digital content in the institution. These were recognized as the information-rich cases that would provide insights into the issues central to the study and were identified to be lecturers, librarians, staff in ICT department, and administrators in top management. The sampling frames for this study were the web pages on the Moi University website with data showing academic staff enrolment in the 15 schools, the members of top management, ICT Directorate staff and library staffing. It was from these pages that sampling was done to obtain respondents for the study.

Selection of a sample from top management was also done purposively whereby the following six individuals were earmarked for inclusion in the study. They were Deputy Vice Chancellor (Research and Extension), Finance Officer, Senior Principal Administrative Officer (Academic), Chief Administrative Officer, University Librarian, and ICT Director. These formed /represented approximately 37 % of the entire management team of the university. The criteria that guided the purposive sampling was to select the information-rich key personnel who would contribute most effectively to the study. From the 15 schools of the university distributed in the campuses of Moi University which at the time included Main Campus, Town Campus and Cheploilel Campus, a sample of 27% was purposively selected. This was 4 out of 15 schools. The schools were purposively selected to include School of Information Sciences and School of Engineering (Main Campus), School of Public Health (Town Campus), and School of Natural Resource Management (Chepkoilel Campus).

Since the study was both qualitative and quantitative in nature, both qualitative and quantitative methods of data analysis and presentation were used. In this study, qualitative data collected from the open-ended questionnaires and interviews was analyzed using content analysis. Data was presented in prose form according to themes that the researcher was able to identify after the coding. The quantitative data was analysed and presented using statistical methods such as totals, averages, frequencies and tables.

PRESENTATION OF FINDINGS

Types of Digital Content

Respondents were asked to indicate the different types of digital content that they created or used in the course of their activities within the university. Table 1 summarizes the responses. 91% of the respondents create/use lecture notes and presentations. This high percentage is indicative of their core business in the university as these are mostly lecturers who are directly involved in preparing teaching material and documents in digital formats. Another 84.8% of the respondents pointed out that they create/use course syllabi. A further 60.9% of the respondents revealed that they create/use theses and dissertations while 65.2% of the respondents indicated they create/use information on academic programs. Eleven respondents representing 23.9% pointed out that they are involved in creation/use of advertisements and news in digital formats. Further, 58.7% respondents create/use electronic communication in the course of their work.

Thirty six respondents (78.3%) respondents indicate they create/use examination results while 26 (56.5%) showed that they create/use software. In addition to these, research papers and e-journals are created/used by 40 respondents (87%). Lastly, images, video, sound (multimedia) were created/used by 16 (34.8%) respondents.

Table 1: Digital Content Created/Used by the Respondents (N=46)

Digital Content	Frequency	Percentage %
Lecture notes and presentations	42	91.3
Course syllabi	39	84.8
Theses and dissertations	28	60.9
Information on academic programs	30	65.2
Advertisements and news	11	23.9
Electronic communication	27	58.7
Examination results	36	78.3
Software	26	56.5
Research papers and e-journals	40	87.0
Images, video, sound (multimedia)	16	34.8

N/B: Table shows multiple responses

From interviews with members of top management, it was established that the digital content created and used varied depending on the core activities of each department. For instance, the Department of the Senior Principal Administrative Officer (Academic) handled content such as information on academic programs, electronic communication, examination results, graduation lists, student enrolment data and lecturer evaluation data. Feedback from users is captured manually using paper forms that users can complete during a visit to the department. On their part, the Office of the Chief

Administrative Officer in charge of recruitment and training mostly handles advertisements and news which they get in soft copy from Heads of Departments who want to advertise vacancies in their respective departments and electronic communication both from within and outside the institution.

The systems librarian confirmed that the library handles a wide variety of digital content ranging from theses and dissertations, advertisements and news, electronic communication, research papers, e-journals and multimedia.

Strategies, Policies and Plans for Managing Digital Content

The study sought to establish whether there were formal systems or strategies, either personal, departmental or organized by the university, to enable the creators of digital content to effectively manage the content they create. When asked about the strategies for management of the content they create and/or use, 22 respondents representing 48% said they do have formal strategies to help them manage the content to keep it valid, accurate, correct and complete. The remaining 24 respondents representing 52% said they do not have any formal strategies to manage their content.

Out of the 22 respondents who have content management strategies, 19 indicated that these are personal efforts at managing the content they create and/or use. Two respondents representing 9% of these 22 respondents are involved in collaboration with an American university which provides strategies to help in content management. These are efforts at an international level which are above the institutional levels. Three other respondents out of the 22 (13%) also indicated that the content management strategies they use are efforts provided by the university. Another 9 of the 22 respondents, (40%), indicated that the efforts that help them manage their content are provided at the departmental level. These results show that the university as an institution and its departments are still not facilitating content management by formalizing the strategies and provision of tools for such management. This is seen in the fact that most individuals handle their own creation and management of digital content while an equally large percentage of respondents have no strategies whatsoever to manage the content they create and or use. From interviews with members of management, it was found that most of the departments create and use digital content but have no independent strategies for its management. For instance, the Senior Principal Administrative Officer (Academic) pointed out that the ICT Department assists his department in handling some of the content such as advertisements and news whereby the admissions department will formulate the advertisements in hardcopy and pass them on to ICT for publication on the website. The department has no independent formal strategies such as databases or any software to facilitate the management of the content they create or use. The officer was aware of the concept of content management but the department relies on the policies and plans for content management devised by the ICT Department. The office of the Chief Administrative Officer in charge of recruitment and training explained that the department has both automated and manual strategies for managing the digital content they create and use. For example, they have a database to store information such as the staff on study leave, extension of contracts and promotions. However, this officer was not aware of the concept of content

management, and was meeting this term for the first time. The department also relies on the strategies and plans set by the ICT Department. The Systems Librarian on his part elaborated that in the past, there was no policy requiring students to submit softcopy of their theses and dissertations alongside the hard copy but this is now changing and current requirements are that both soft and hard copy must be submitted to the custody of the university library. In the past, students have been hindered from submitting the soft copy due to fears that their work will be plagiarized and also the issue of ownership of the work. The system librarian also verified that the university does not have an institutional repository in spite of a resolution to that effect having been passed several years ago but has not yet been implemented officially. He disclosed that there are small scale efforts going on within the library to establish this repository with the help of students on attachment from the School of Information Sciences. Further, he explained that there is a policy document that has been developed by the library to guide users on the use of the information systems and electronic resources within the library. The document is entitled '*Information Systems and Electronic Resources: Best Practice and Use Policy*'.

On the side of the ICT Directorate, *the director confirmed that he is aware of the concept of content management and was able to describe it adequately. He explained that there is currently no specific policy for content management in the university but acknowledged that a policy is important. However, there are specific standards that the Directorate tries to enforce to keep the content in uniformity; for example, documents submitted for uploading to the university website should be prepared in PDF format, using HTML or PHP as the programming languages where possible. The department has an information systems support officer who oversees development of content and its storage and distribution. Information systems assistants in the department modify the content to make it appropriate for display and posting onto the Internet. He also cited the fact that he is aware of the risk of litigation in case of wrong information appearing on the website. A policy will provide guidelines to prevent such incidents from occurring.*

It was found that at the moment, the retention policies that apply to content and information on the university website are unspoken and unwritten. It is assumed that as long as there is no update from the concerned school for information about them on the website, then the particular school is satisfied with the content as it is. It will therefore be left on the website until such a time that the school submits an update. Newsletters will stay on the Website for approximately one year before they are removed from active display on the Website. The director further explained that once content is no longer actively useful on the Website, it is withdrawn from the web page and stored in a digital archive. Links to it will then be created to re-direct interested parties who may wish to access the same content. Another way is by creating mirror sites away from the website such that content is stored therein and an interested user is able to access the same. The director explained that publishing on the web is simpler, more cost effective and provides faster delivery of information. The expertise to do this can be created internally as opposed to print publications which need more unique resources which in most cases can only be found outside the organisation. He emphasised the need to explore

more uses of the Internet and websites to publish organisational content. On policy issues, the ICT director pointed out that the university's ICT policy is currently under development and its principal concern is the effective and efficient (responsible) use of information and communication technology resources. It is intended to ensure among others, the integrity, reliability and good performance of university ICT resources, and that the user community operates according to established policies and applicable laws. The users of the content created in all the departments described above are students, lecturers, prospective applicants, researchers, parents, administrators and the general public.

Support of the University

Respondents were asked to give their views on a series of questions which was aimed at evaluating their satisfaction levels with facilitation by the university to create, access and use digital content. Their responses are captured in Table 2. The results in Table 2 show that 34.5% of the respondents strongly disagree with the statement "Considering the ICT infrastructure available in my department, the facilities adequately support me in my creation, dissemination, storage and use of digital content." Eight respondents representing 17.4% are undecided about this statement while 22 (47.8%) respondents strongly agree with this statement.

Looking at the results for the statement 'there is adequate support of the university to equip me to publish my research work on the Internet', they show that 45.6% of the respondents strongly disagree with the statement while only 30.4% agree with this statement. Eleven (23.9%) respondents of the respondents are undecided about this statement. It is clearly evident that more respondents feel that the support of the university towards their online publishing activities is inadequate as compared to those who are satisfied with the support given by the university. When asked to evaluate the statement, 'The Internet connectivity enables me to easily access digital content on the Web', 37.0% of the respondents strongly disagreed with the statement while 47.8% strongly agreed with the statement. On the other hand 15.2% of the respondents were undecided about their agreement or disagreement with the statement. The responses towards this statement show that more people are in agreement that the status of Internet connectivity in the university enables them to access digital content on the web.

Strongly Disagree and Disagree were merged to Strongly Disagree

The results on the evaluation of the statement 'The university website enables me to access university information in a satisfactory manner', show that 36.9% of the respondents strongly disagreed with this statement while 52.2% strongly agreed with this statement. A further 10.9% were undecided about their agreement or disagreement with this statement. These results show that majority of the respondents were satisfied with the availability of university information via the website. This question was pertinent in addressing the objective on assessing user satisfaction with the existing content management strategies in facilitating access and retrieval of digital content. Looking at the findings from this set of questions, it is evident that most respondents are

Table 2: Facilitation for Management of Digital Content (N=46)

S / N	Measure of satisfaction with facilitation for management of digital content	SD	D	U	A	SA
1	The ICT facilities support me in creation, dissemination, storage and use of digital content.	3 (6.5)	13 (28.0)	8 (17.4)	16 (34.8)	6 (13.0)
2	There is adequate support of the university to equip me to publish my research on the Internet.	6 (13.0)	15 (32.6)	11 (23.9)	14 (30.4)	0 (0.0)
3	The Internet connectivity enables me to easily access digital content on the web.	4 (8.7)	13 (28.3)	7 (15.2)	13 (28.2)	9 (19.6)
4	The university website enables me to access university information in a satisfactory manner.	7 (15.2)	10 (21.7)	5 (10.9)	19 (41.3)	5 (10.9)

Note: Strongly Agree and Agree were merged to Strongly Agree

satisfied that the university has provided adequate tools (ICT resources and Internet connectivity) for content creation and access. As a result, most people in the university can then create and access digital information adequately. However, the findings also indicate that the institution has not done enough to facilitate publication of local content so that it can be accessed on the global arena. However, the university through the library is currently setting up an institutional repository that will facilitate dissemination of local content. Management of digital content encompasses much more than simply creating it. This content should also be kept up-to-date, archived, published and retrieved at access points remote from the points of creation.

Suggestion for Improving the University's Global Ranking

In 2009, Moi University was ranked No. 86 in Africa and 7,965 globally. This was based on Website content, currency, quantity, types of content, relevance and generally, their presence on the web. These are criteria that were considered the most relevant for this study on content management. The purpose of this question was to find out what input the respondents as members of the MU community can give to improve their institution's global ranking. To begin with, 12 respondents (26%) left this question blank and did not attempt to provide any suggestions as to how they could help improve the institution's standing in the eyes of the ranking committee. Reasons for this could be that they lack awareness on how the ranking is done or conducted. The responses from those who answered this question were as varied as the respondents themselves and are summarised in the discussion below.

First, a suggestion that was given by almost all respondents was that they would attempt to publish their research findings on the web. This includes the findings from all projects they are involved in and the reports they may be required to write which should ideally be available on the web. In addition to this, some of them emphasised that the university must provide incentives to enable their staff to publish on the web. They were categorical that the university must be more proactive in funding research and facilitating the quality and volume of e-publications resulting from such endeavours. One

respondent expressly stated that there should be a section on the MU Website through which academic staff can upload their research findings. In connection to this was the suggestion that the relevant personnel should always update the MU website to provide current information. This was further collaborated by the Senior Principal Administrative officer (Academic) who when interviewed on the issue of university ranking, reckoned that "as an institution, we do not sell ourselves enough on the net, and therefore outsiders do not know much about us." He added that "people think it is the administration only to be responsible but I think we all have a collective role to play to improve our institution's visibility. Many of our staff are involved in collaborations for research and other projects. This information should be obtained and uploaded onto the net". These views were echoed by the other members of management who also felt that further action needs to be taken to improve usage of the website in terms of design, content reliability and currency, availability of the site among other issues. This would encourage more people to use the website and improve on the visibility of the institution.

Another suggestion was that the university should provide staff with ICT resources including improved Internet connectivity. Tied to this is the suggestion to equip staff with web literacy to enable them use the web effectively to access information and also upload their own information onto it. Two of the respondents suggested that they would be willing to participate in development and implementation of policy on content development and management. This will guide them (and others) to effectively create and manage digital content that by implication, should then improve the institution's online visibility. Another suggestion from 4 of the respondents was that they will upload their Curriculum Vitae on the web and encourage their colleagues to do the same. This will directly promote the online visibility of the schools and departments they belong to, and therefore the visibility of the university as a whole.

Another suggestion from 1 of the respondents is that the university should develop an Institutional Repository (IR) to store all projects, theses and dissertations produced by its members. The university should also increase funding to sustain these efforts. Another suggestion from another respondent is that the university should advertise its academic programs on the web. This can be tied to another suggestion that the university should enable students to apply online for the academic programs of their choice and also access examination results online. In addition, there was a suggestion that lecturers should be encouraged to upload lecture materials (in audio, text or video formats) on the web so that students and other users can freely access it from wherever they are located. Four respondents suggested that the university management in different departments, sections, and divisions should be encouraged to provide updated digital information about their units as this is what comprises web content. The members of these units should be encouraged to be creative and proactive in assembling this information ready for posting on the web. This was further collaborated by the Director of ICT who conceded that the problem of inconsistent update of content on the university website has compromised the ranking of Moi University. He reiterated that schools need to be more proactive in the currency, quality and quantity of

information appearing about them on the web. They should also encourage their members to inform ICT about any conferences they attend and the publications they make so that this information can be uploaded to the website and improve the university's visibility. In connection with this, another suggestion was that the MU website should have updated data of all staff members and their qualifications. One respondent suggested that each school in the university should start and sustain a refereed online journal that can be accessed freely from anywhere in the world. Another respondent confirmed that he publishes in international journals that upload his papers on the web i.e. electronic publications and he always identifies himself with Moi University. One respondent suggested that the members of staff should engage more in extension activities and have this reported online. Another suggestion from those who answered through the questionnaires was that the Chief Administrative Officer, Chief Academic Officer, Vice Chancellor and other members of the university management should be educated on the use of ICT or else all other efforts are in vain. These views are supported by Fuller (2004) who says that a web presence does not just happen. Content must be created, tested, approved, formatted, loaded onto servers and managed for years throughout the life cycle of the information. He explains that computer hardware and telecommunication networks are needed to provide access while designers and programmers are needed to create and maintain interactive applications that provide online services. According to Fuller, all of this takes dollars and people and policies and procedures which are incorporated into the notion of web management. In this connection, Moi University as an institution ought to make conscious effort to put up the right web presence and do what it takes to improve on its global ranking amongst academic institutions of higher learning.

DISCUSSION OF FINDINGS

The Nature of Digital Content Generated at Moi University

The study established that approximately 98% of the respondents who participated in the study have access to computers to facilitate their work activities. This in turn creates a large variety of digital content. Moi University is a teaching institution and most of the respondents involved in the study were teaching staff. They are involved in preparing teaching material and documents in digital formats. Other digital content created is used for administrative purposes. Generally, the digital content includes:

- a) Lecture notes and presentations
- b) Course syllabi
- c) Theses and dissertations
- d) Information on academic programs
- e) Advertisements and news
- f) Electronic communication
- g) Examination results
- h) Software
- i) Research papers and e-journals
- j) Multimedia (Images, video, sound)

Some of the content (e.g. lecture notes, theses and dissertations, software and multimedia) belongs to individuals

while some belongs to the institution (e.g. course syllabi, theses and dissertations, advertisements and news, and examination results). From the study it was noted that this content is intended for use by both students and staff and also by users outside the institution who include researchers, industry professionals, quality assurance units, and former students.

Existing Methods and Strategies for Creation, Update, Publishing, Translating, Archiving and Retrieving Digital Content at Moi University

The study established that there is some awareness on the concept of content management amongst some of the members of staff at Moi University. In addition, there are some strategies for the management of digital content including creation, secure storage and retrieval but these are largely personal efforts made by the creators of the content. In spite of provision of tools for creating digital content (by the university), the study found that content management strategies at institutional level are still at minimal levels. The university website is an important tool for provision of university related information and can be an important avenue for management of digital content. However, the study established that while respondents regularly access the website, majority (52.2%) are dissatisfied with the information services it offers. Access to the website is often compromised by poor Internet connectivity in the university, information on the website is outdated due to irregular updating by the concerned personnel, and it is too general in approach so that users do not get adequate information specific to their departments. Finally, there is no research output published on the website. This is in spite of the numerous research activities and resultant output that has been published via other avenues such as international and local journals. Coupled with these are strategies to ensure that content created is accessible by the targeted users in the intended format. The study established that creators of content especially the teaching staff make commendable effort to ensure that intended users can actually access and use the content in digital form. Some of these strategies include training the users, availing the content in soft copy, distributing the content in hard copy, publishing in online scientific journals and using the Chisimba e-learning portal to disseminate digital learning materials.

User Satisfaction with the Existing Content Management Strategies in Facilitating Access and Retrieval of Digital Content

The study established that more respondents (47.8%) are satisfied with the ICT infrastructure provided in their respective departments and feel that they adequately support them in creation, dissemination, storage and use of digital content. This is as opposed to 34.5% who feel otherwise. On the other hand, majority of the respondents feel that the university does not support them in publication of their research work on the Internet. This is in contrast to the response about the effectiveness of Internet connectivity in the university in enabling users to access digital content on the web. On this, 47.8% of the respondents feel that they are well enabled to access digital content while 37% feel otherwise. When combined with the findings that address the objective on content management strategies, these particular findings

show that in spite of provision of tools to access digital content, other content management tools, activities and strategies are not catered for especially at institutional level. This has negatively impacted on users' satisfaction with existing content management strategies.

Global Best Practices in Content Management

From the literature review, several aspects on global best practices were identified. These include recommendations for involvement of upper level management in content management projects and initiatives to ensure decisions are made, implemented and communicated (Goodwin, *et al*, 2005); and involvement of subject specialists for content, collection managers for organization, in addition to people who understand content management software and its capabilities. Williamson (2005), on digital preservation, advises that consideration must be given at an early stage to ensuring the longevity of digital resources, in order to protect and maximize the return on the investment in content creation. The choice of file and media formats used to create, store, and deliver digital content, and the strategies that are employed to manage these in the long-term are crucial.

The National Information Standards Organisation (NISO) suggests 9 principles that should apply to good digital collections namely: creating digital collections according to collection development policies, describing collections to facilitate their use, actively managing collections during their lifecycle, enabling availability and accessibility of the collections to users as needed, provision of user statistics, respect for intellectual property rights, enabling interoperability of collections, integrating a collection into users' workflow, and long-term sustainability of a collection.

CONCLUSIONS

This study investigated the content management practices at Moi University. It was intended to examine the types of content generated at the university and the strategies for their management. This was in relation to the fact that content management has been reported to pose challenges to institutions and organizations and Moi University has been no exception. Moi University as an academic institution has implemented several information systems whose information products are not yet effectively managed. The institution lacks formal coherent strategies and frameworks to identify the digital content generated from its departments, and thereafter guide its management.

The study specifically sought to examine the nature of digital content generated at Moi University, analyze the existing methods and strategies for creation, update, publishing, translating, archiving and retrieving digital content at the institution, assess user satisfaction with the existing content management strategies in facilitating access and retrieval of digital content. In view of the study's findings, this paper concurs with Mutula & Wamukoya (2007) in their observations that content management poses serious problems to institutions due to inadequate infrastructure, weaknesses in content organisation, consistency and management, lack of institutional framework for managing content, accessibility issues, underutilisation of content, lack of preservation plans

for content, lack of cultural policies, lack of capacity building plans and poor e-content security. The study revealed that inadequate infrastructure has compromised the effective creation and management of digital content and lack of strategy while absence of a content organisation approach has had a negative impact on accessibility and use of content in the institution. Further, there is evidence of lack of preservation plans, both long and short term, for the content created in the university. This implies that content may have to be recreated severally or duplicated in various locations because no content is preserved for future use or for use by other departments or individuals.

This paper therefore concludes that despite the presence of extensive digital content in the university, lack of formalized strategy and policy guidelines has greatly compromised its management and contributed to the problems experienced by users of the content. The study also concludes that best practices in digital content management as upheld by institutions of excellence such as National Information Standards Organisation (NISO), Washington State University and Digital Preservation Coalition have not been explored at Moi University and this needs to be addressed. In this connection, the study concludes that a framework is vital to lay the necessary groundwork and provide guidelines for content management at Moi University.

RECOMMENDATIONS

In order for the university and its members to benefit more from the ICT presence and the digital content generated, it is important that the following issues be addressed as a matter of urgency. This is because digital content generation and use are some of the fastest growing activities in the university and on the globe as a whole. The institution has invested a great deal of resources in terms of finances, personnel and time to implement ICT facilities that create and are used to access digital content. It was reported that respondents lack adequate numbers of computers and related electronic equipment to facilitate their access to and use of digital content. Slow and unreliable internet connectivity was another problem that was cited. It is therefore recommended that due to the ever increasing demand for ICT facilities, it is important that the university makes effort to increase the numbers of computers, printers, LCD projectors, Internet access points and other facilities in schools and departments. This would enable users to effectively and efficiently create and access digital content such as lecture materials, presentations, communication, research output and others on a day-to-day basis. This would also include improvement on Internet/intranet connectivity by setting up LANs in departments and setting up wireless connectivity zones whereby individuals can access information on the Internet more easily. This can be facilitated by the ICT department in liaison with systems administrators in the various schools and units. Following a suggestion that the university mounts training programs to equip users with skills to use the emerging technologies both hardware and software, and also review curricula to include ICT courses for training of students, it is recommended that the university should raise awareness of the importance of digital content in the information age and generally build institutional capacity to create, collect, organize, store and share digital information. Hindrances to accessibility of information should be

significantly reduced amongst the members of the university community. To do this, the university should mount training programs to educate members on the use of ICT to create their own documents, to communicate amongst themselves and their peers, to access local and global information on subjects of interest, to communicate with their students and other users of content they create. Additionally, it is vital that awareness levels on the concepts of content management are raised amongst creators and users of digital content at the university. This can be done by the ICT department in liaison with the ICT personnel in the various schools and units of the university.

For a long time, the university has planned to implement a mandatory campus-wide ICT curriculum that will give all students basic skills in use of ICT and further enable them to access and use digital information. It is high time this curriculum was completed and implemented. This will raise the general standards in use of ICT to deliver course content. In addition, there is a policy requirement that all new academic programs must include an ICT component for them to be approved.

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