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EVALUATION OF E-LEARNING PLATFORM FOR MOGADISHU UNIVERSITY: TECHNICAL PERSPECTIVE

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Abstract

The study intended to evaluate the E-Learning platform for Mogadishu University. The researchers focused on correctness, usability, maintainability and integrity. Using a retrospective design with joint requirement planning (JRP) approach students, instructors, administrators, technical staff and parents were presented the system and later interviewed for their respective opinions. The findings showed that to a large extent the E_Learning platform served the right purpose; but more was suggested to be done on integrity and usability. The researchers thus concluded that the system can still stand to serve the purpose for which it was designed and recommended that authenticity be reinforced since most activities take place off campus.

Keywords: E_Learning, Correctness, Integrity, Maintainability, Usability.

1. Background

Providing flexible education for everyone, everywhere, has been one of the fundamental goals of distance learning. While traditional (i.e. pre- Internet) distance learning methods and materials have been around for many years. Acosta (2004) asserts that the demand to automate university processes is becoming important in line with university quality assurance. However, with the high costs of Integrated Academic Management Systems (JAMS) on the market, universities have found alternative ways of meeting their customers' expectations within their constrained budgets. These alternatives ought to align with both organisational and customer (i.e. students) needs. In Student Information Systems, usually the registrar has the primary responsibility of maintaining the integrity of the examination records and safeguards them in accordance with institution, system, state, and regulations. When making this determination, an institution should consider which office has the responsibility for the administrative function that has the best understanding of the meaning and status of the data and in line with this, should be knowledgeable about the data use, the regulations that apply to it, and their interrelationships with other databases or information management systems (Newton, 2007). Students records' management has three major goals (Looho and Gallegos, 2001): i) responsibility of the data; ii) a written policy on information management and; iii) process for controlling access to information. Most colleges and universities place responsibility for data ownership and electronic access to data with the managers of the information; the same offices have the responsibility for the administrative function and the paper version of the information.

Somalia is undergoing transformation by use of Internet-based course management systems. The adoption of the Internet as a new medium and the rapid evolution of web-based systems and tools have provided new approaches towards solving fundamental problems of traditional distance learning: mainly isolation and the lack of knowledge construction in a social way as it occurs in the classroom. Professional courses and distance learning Center in Mogadishu University implemented a web based training platform to counteract the then standing challenges of easy accessibility to students, accountability and general academic management. Since its implementation no evaluation has been done given that the hardware platforms on which the application was initially installed have undergone change. This may have a far reaching effect on the integrity, correctness, mantainability and usability of the E-Learning system; hence an evaluation on technical perspective.

2. Literature Review

Correctness

A program should operate correctly else it provides little value to its users. Correctness is defined as the degree to which the software performs its required function (Morter, 2000). The most common measure for correctness is the number of defects per unit module, where a defect is defined as a verified lack of conformance to predetermined requirements. When considering the overall quality of a software product, defects are those problems reported by users after the program has been released for general use. For quality assessment purposes, defects are counted over a standard period of time, typically one year. A correct program also enhances user trust and increases reliability. Such an aspect gets the program acceptable to users and hence optimal use (Gupta, 2007; Stackowiak et. al, 2007). Cui et al, (2007) & Zeng et al., (2006) allude to the effect that a correct program facilitates profitability of the company in that some defects

may be so detrimental that may cause huge sums of money to fix. Moreso, the results may have a direct effect on future use. If the system gives incorrect results such effect may consequently affect its usability.

Maintainability

Robert et., al (2004) assert that ssoftware maintenance accounts for more effort than any other software engineering activity. Maintainability is defined as the ease with which a program can be corrected if an error is encountered, adapted if its environment changes, or enhanced if the customer desires a change in require. There is no way to measure maintainability directly; therefore, one must use indirect measures. A simple time-oriented metric is mean-time-to-change (MTTC), the time it takes to analyse the change request, design an appropriate modification, implement the change, test it, and distribute the change to all users (Somerville, 2001). On average, programs that are maintainable tend to have a lower MTTC (for equivalent types of changes) than programs that are not maintainable. Other potential instruments used include a cost-oriented metric for maintainability called *spoilage*. This is the cost to correct defects encountered after the software has been released to its end-users. When the ratio of spoilage to overall project cost (for many projects) is plotted as a function of time, a manager can determine whether the overall maintainability of software produced by a software development organization is improving. Actions can then be taken in response to the insight gained from this information (Curt, 1999). Many times software undergo changes due to a shift in hardware platforms and corrective mantainence to fix emerging errors which activities are inevitable and so call for vigilance during the design and implementation of software like E-Learning systems (Gangadharan & Swamy, 2004; Berson et al., 2002).

Integrity

Software integrity has become increasingly important in the age of cyber computing where hackers, crackers and firewalls have taken a centre stage (Wanyembi, 2002; Acosta, 2004). This attribute measures a system's ability to withstand attacks (both accidental and intentional) to its security. Attacks can be made on all three components of software: programs, data, and documents. To measure integrity, two additional attributes should be defined: threat and security. Threat is the probability (which can be estimated or derived from empirical evidence) that an attack of a specific type will occur within a given time. *S*ecurity is the probability (which can be estimated or derived from empirical evidence) that the attack of a specific type will be repelled. The integrity of a system can then be defined

Integrity = summation [(1 – threat) _ (1 – security)]

where threat and security are summed over each type of attack. Integrity can be enhanced if both physical and logical securities are emphasized. Most people tend to concentrate on the former and less on logical security (Adelman et al., 2002); however making use of both security in depth and security in diversity greatly improves integrity (Malhotra, 2000). Security in depth is when a security mechanism is employed and beefed up. For example, employing a security guard with machine gun and bullet proof jacket; although secure may still be compromised. Seufert, et al., (2005) advise that security in diversity suffices in a bid to counteract the attacker's techniques. If a security guard is employed, put a long perimeter wall and install intrusion detection systems.

Usability

Newton (2007) allude that "user-friendliness" has become ubiquitous in discussions of software products, and E-Learning platform is not exception. If a program is not user-friendly, it is often doomed to failure, even if the functions that it performs are valuable (Ryann, 2009). Usability is an attempt to quantify user-friendliness and can be measured in terms of four characteristics: (1) the physical and or intellectual skill required to learn the system, (2) the time required to become moderately efficient in the use of the system, (3) the net increase in productivity (over the approach that the system replaces) measured when the system is used by someone who is moderately efficient, and (4) a subjective assessment (sometimes obtained through a questionnaire) of users attitudes toward the system (Looho & Gallegos, 2001). Usability has manifested itself spectacularly in all software projects. If the system id complex to the effect that a user gets disgusted with navigating the interfaces he/she is likely to neglect it and resort to something else (Phillip, 2001; Therese & Berth, 1997; Ravi et al, 2011; Thomsen, 2002).

3. Methodology

The study employed descriptive design with a joint requirement planning technique where 34 finalist students, 11 instructors, 3 technical staff and 2 administrators from Centre for Professional Course, Mogadishu University were selected using Sloven's formula and presented the system and later interviewed on what they felt about the E-Learning platform serving the purpose for which it was designed.

4. Findings and Discussion

Correctness was defined as the degree to which the software performs its required function. The interview was guided by questions regarding the number of defects per unit module, where a defect was defined as a verified lack of conformance to predetermined requirements of teaching-learning in Mogadishu University. Findings showed that majority of the respondents assessed the E-Learning platform as correctly executing its intended purpose; especially in administering examinations and quizzes. The findings were corroborated with studies carried out by Gupta, (2007); Stackowiak et. al, (2007); Cui et al, (2007) & Zeng et al., (2006) who alluded that the correctness of the software is key in its adoption and optimal use.

Mantainability was defined as the ease with which a program can be corrected if an error is encountered, adapted if its environment changes, or enhanced if the customer desires a change. The interview was guided by questions regarding the time it takes to analyse the change request, design an appropriate modification, implement the change, test it, and

distribute the change to all users. Cost-oriented metric for maintainability called *spoilage* was the main determinant of the ease. This is the cost to correct defects encountered after the software has been released to its end-users. It was discovered that the software was relatively easy to maintain but cited the challenge in design. This challenge came as a result of levels of literacy on system design the users had. On further investigation with technical staff, the design was easy but focused more on the learner and less on the instructor for checks and balances. The findings was supported by Gangadharan & Swamy, (2004) and Berson et al., 2002).(who alluded that vigilance is vital in considering system design. They assert that if the design does not suit the user expectations, it may also contribute to its rejection.

Usability insinuates that if a program is not user-friendly, it is often doomed to failure, even if the functions that it performs are valuable. Usability is an attempt to quantify user-friendliness and was measured in terms of four characteristics: (1) the physical and or intellectual skill required to learn the system, (2) the time required to become moderately efficient in the use of the system, (3) the net increase in productivity (over the approach that the system replaces) measured when the system is used by someone who is moderately efficient, and (4) a subjective assessment (sometimes obtained through a questionnaire) of users attitudes toward the system. The findings show that the E-Learning platform was generally easy to use but required quite some advanced skills to put it to full use (Newton, 2007). Moreso, it was observed that most modules require less time to learn to use them, except video tutorials and posting and retrieving questions for both students and instructors. This finding was corroborated with Ryann, (2009) who advanced that to make software valuable, users have got to interact with it in a friendly manner.

Integrity measured a system's ability to withstand attacks (both accidental and intentional) to its security. The interview guide was guided by questions related to threats and security. Threat was defined as the probability that an attack of a specific type would occur within a given time; while *S*ecurity was defined as the probability that the attack of a specific type would be repelled. The findings showed that the E-Learning platform needs more fine tuning on the integrity aspect. It was observed that the system was not able to ascertain the user as either a legitimate student sitting examinations or a masquerade; despite the bank issuing unique codes to prove payment. Some respondents suggested use of biometrics but others cited the challenge of insufficient bandwidth especially when the number of students increases. This finding jived with Acosta, (2004) and Seufert et.al, (2005) who allude that cyber computing, the current security threat, requires security beyond physical security; hence security in diversity.

5. Conclusion

The researchers concluded that the E-Learning platform is suitable for the original problem with distance learning of Mogadishu University. They however recommend that it could serve the purpose best if the integrity aspect is enhanced to keep authentic track of students' and instructors' activities.

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