Proposing an Innovative Library Management System for Afghanistan: E-Ketabtoon

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Abstract
At present, the higher-education libraries across Afghanistan are entirely paper and card-based. This paper proposes an innovative library management environment known as "*e-Ketabtoon*". It aims to automate and replace the current card and paper system. The prominent features of e-Ketabtoon includes: (i) acquisitions (ordering, receiving, and invoicing materials); (ii) cataloging (classifying and indexing materials); (iii) circulation (lending materials to patrons and receiving them back); (iv) serials (tracking magazine and book holdings); and (v) a DBMS with a user interface in a browser. With this system in place, the university could benefit from instant library access; enhance the overall management of the library and learning resources across the school: streamline acquisitions, circulations and cataloguing workflows; and improve cost savings. The system will thus, encourage the use of libraries by students for learning; improve access to reading resources; and enable independent learning, resulting in improving the literacy levels in Afghanistan. Hopefully with all of the changes, e-Ketabtoon would make the library run much more efficiently and smoothly. With less time spent filling out paperwork, more time can be spent to assisting students and keeping the colossal amounts of media held in the library. The system will also be more efficient, dependable and user friendly to everyone.

Keywords: Relational Database; Information Communication Technology; Web server

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Introduction

The last quarter of the twentieth century has been devastating for Afghanistan. It is also one of the unfortunate countries that lack a viable, stable and uniform education sector. After the overthrow of the Taliban regime in the late 2001, Afghanistan appealed to the international donors for rebuilding the Afghan education sector. The response was encouraging and five universities emerged in various provinces.

In the same period Information Communication Technologies (ICTs) were introduced in Afghanistan to revitalize the education sector in this country. ICTs that include computers, mobiles, TV, social media, etc., have the potential to enhance students' technical know-how and skills. It also offers a wide variety of educational services and facilities without any limitations of time and space e.g., digital library management systems, distance learning, virtual learning environments, etc. Although, ICTs were widely welcomed in Afghanistan, yet it faces several implementational and resource related issues.

Currently, the existing libraries are insufficient to meet the knowledge demands of the Afghan students, academia and researchers. They are old-fashioned paper or card-based libraries lacking sufficient resources and efficiency. Similarly, there are other issues related to ordering materials, insertion, deletion, thefts and damages. Contrary to the traditional library management system, a digital web-based library management environment offers a more secure, highly efficient, and maticulious facility. Library Management System (LMS) is an integral component of e-learning paradigm. It is a project to manage resources in the library, used to track items owned, orders, and clienteles who have rented the books or other materials.

This study proposes an innovative LMS called as "e-Ketabkhana" to automate and replace the traditional library management practices in Afghan universities. But nowadays Information and Communication Technology (ICT) has rapid development across the world. Although, the big problem is how to use or take outstanding benefits from this opportunity. Currently, ICTs have vital position in e-government, e-health, e-education, e-commerce etc. Information and Communication Technology (ICT) has potential to accelerate, enrich student knowledge related to their major to find good jobs in the future and serve to their society even to the world with fully honesty.

So, this paper will focused on education part of the society. The major method for fighting against social exclusion is education, so it means literary and media education at schools and universities have important role. The security situation is not better in Afghanistan than other countries in the world; e-education will reduced the problem of education system in Afghanistan. So, still there is paper-base or card-base system at universities' and libraries that create more problems such as acquisitions, cataloging, circulation and serial numbers of materials.

This study will propose a system through ICTs to reduce the mentioned problems knows Library Management system (LMS). Library Management System (LMS) is the precondition of e-education. Libraries are the repositories of the wisdom of the ages to keep in form of digital information for using at the present and for future or next generation to access information comfortable regardless the time or location (R.Kavitha, 2009). This system will change the paper-base system to digital system.

E-ketabtoon

Distribution of traditional knowledge resources have failed in developing countries. Therefore digital libraries are very good alternative for regions and societies where there are more difficulties to access information. Many researchers are willing to use digital system to access recently digital contents and publication across the world. As the study noticed before proposing an innovative library management system knows *e-Ketabtoon* to change the paper form to electronic or digital system. Ketabtoon is the Pashto term for library in Afghanistan.

This system will provide outstanding facilities such as (i) acquisitions (ordering, receiving, and invoicing materials); (ii) cataloging (classifying and indexing materials for searching); (iii) circulation (lending materials to patrons and receiving them back according to deadline or timetable); (iv) serials (tracking magazine and book holdings); and (v) a Database Management System (DBMS) for storing a huge number of materials with friendly user interface in a browser. The most innovative features are text recognition and e-contents. Test recognition means changing materials from Pashto or Dari languages to English language.

E-contents means providing an environment for all lecturers across the countries to upload there materials in the library and users will access through library. With this system in place, the university could benefit from instant library access; enhance the overall management of the library and learning resources across the university: streamline acquisitions, circulations and cataloguing workflows; and improve cost and time savings. So, data mining is very important part of digital library, and data mining is divided by three categories, structure, content and user log mining but the important one is data mining (Zhang, 2011).

Digital library has received extensive consideration in the recent years to access digital information regardless time and place. The system will encouraged the use of libraries by students, teachers, researchers and staff for learning; improve access to reading resources; and enable independent learning even disable people, resulting in improving the literacy levels in Afghanistan. In order to come up with ideas, recommendation, tools, techniques, concepts and methodologies covering the need of today about the processes of developing web-based application (Peter H. Carstensen, 2001). The significance of this project includes: (i) collection and dissemination of information;(ii) satisfaction of user's needs; (iii) educational reading with academic and technical collection; (iv) provision of cultural and recreational study; (v) provision for syllabi study etc (R.Kavitha, 2009)

Education will accelerated by using digital library from remote spaces just by using ICTs tools. Furthermore, digital library can assists human development and dissemination of logical materials. The focused point will be how to use new technology and discover problems with related solutions in term of e-learning, especially related to digital library in Afghanistan because of library is essential element of society.

Architecture

E-Ketabtoon system is a web-based system using client-server architecture. The architecture (*see Figure 1*) is combined of two main sides: (i) client side; (ii) server side. The client side has general interface to access three types of information user management, digital library and physical library records in database. The mentioned interface is using different technologies to provide services for clientele such as accessing, searching etc (Naikm, 2012). Client side includes of user management and search option. Clientele can manage his/her personal information and search the data inside the database through interface.
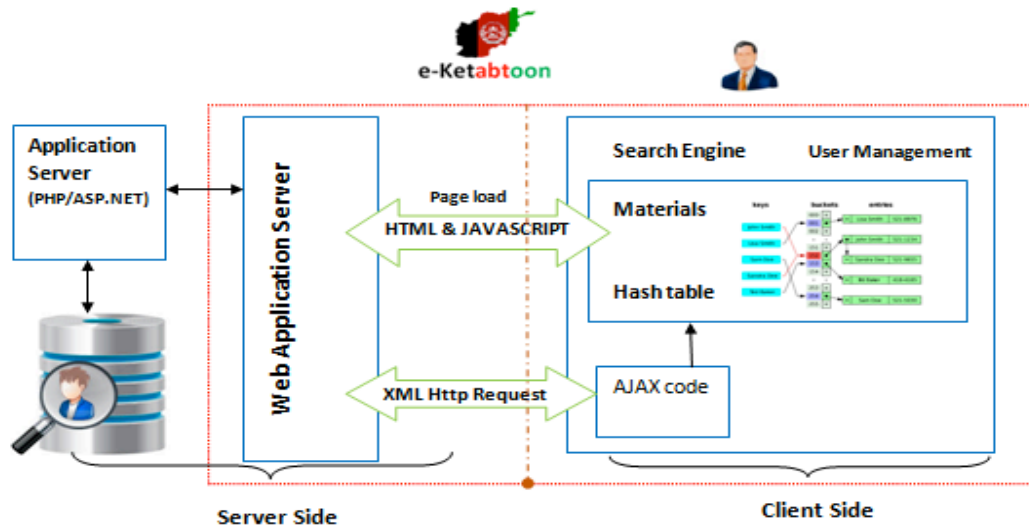

Figure 1. e-Ketabtoon architecture

The server side is using application server and database to store the materials, for example PHP or ASP.NET to provide interaction with database for extracting information according to Hash Table structure or user query. This system uses Hash table for fast accessing materials by using index.

Features

The prominent features include: (i) digital collection of information (large, well-organized and managed, different formats); (ii) Offered all services to users; (iii) provide access to digital materials outside of the system;(iv) Efficient access to large number of distributed system; (v) replace the current paper form library;(vi) rural area connectivity (Mrs.Namrata, 2014) (vii) Open up all cultural and gender barriers for women and ladies. This means women can access educational, historical materials and Afghan knowledge heritage from their homes.

In addition, e-Ketabtoon will improve the digital book culture in Afghanistan, multilingul (Pashto /Dari) materials for learner, preservation of Afghan valuable knowledge and research work of our ancestors and this system will improved the overal library management structure. The aforementioned features will improve the overall management of library and maximize the digital divide.

Development Strategy

This paper uses learner center design strategy for development of the software. The important part for software design is development strategy. Development is a process which follows different steps to achieve the goal. In the past couple of years many model have been created. However, the agile method is based on iterative and incremental process (*see Figure 2*) where the requirements and solutions are involved (Software Design Consultant). According to software engineering, agile method is flexible to requirements; to reduce the risks which have affect on quality of software. This approach requires involving customer in the whole project. In addition, agile method or learner center design approach offers an outstanding framework for users' satisfaction. Verily, users' satisfaction is the quality of the system. Furthermore, collaboration and teamwork is the main point of the noted method. The involvement of user in project has effect on the result of the system. The aim of the noticed method is to involve the learner in the design process and keep learner at the center of the design process.

Moreover, the optimal advantages of agile methodology or learner center design strategy are:

a) Continuous feedback from user
b) Keep user at the center of the design process
c) More transparency
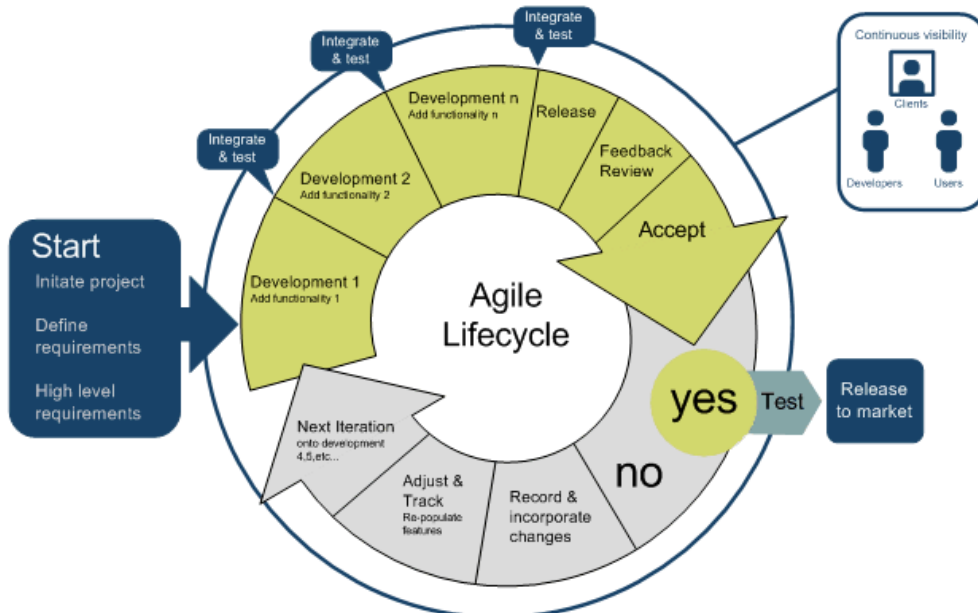d) Better visibility etc (Software Design Consultant)

Figure2. Development strategy (Software Design Consultant)

Evaluation Strategy

Evaluation is a research activity which is combined of theoretical and practical impacts and the objective of evaluation process is to address user's and received valuable comments and feedback from users for improvement of system (Marchionini, 2000).This system will be evaluated by system and user, but according to Iterative Design Cycle (IDC) the system should be evaluated as formative and summative. Formative evaluation is done before starting or in between the actual project and it is a primarily building process for accumulate the whole system. On the other hand, summative evaluation is also important; it means how to measure the outcome of the system. In the last noticed evaluation the users' requirements will be addressed. The evaluation phase will evaluate different parts of system such as:

• Structure function should be evaluated
• Internal operation (cataloguing, classification, recording, generating report, labeling etc)
• Service to users
• Update technology for new service demand on users etc

With different criteria such as success, efficiency (quantitative and qualitative will be observed), effectiveness (focus on goals), cost etc. (Wilson), evaluation strategy will be different system to system. However, the overall aim is to evaulate the system function's (Marchioni, 2000) to address user satisfaction. In addition, in the *e-Ketabtoon* evaluation is not one time or one step process. We will do evaluation time to time to improve the design of system and we will go through lab testing then expert walk-through, if every things goes well we will be entry to the real field test which will be carry out in Afghanistan with real users.

Possible Limitation

Despite the importance of this study, there are limitations that will be reduced in the future such as. (i) lack of professional experts of new technology. Users of library managenemt system do not have the equal knowledge of using ICTs. So, professional experts are the main part of the system . It will take time and cost with training; (ii) weak elctricity infrastructure, we have to provide a superior fundamental electricity infrastructure for e-Ketabtoon across the country; (iii) no national ICT policy to provide a framework for multilingual materials ; (iv) e-Ketabtoon is concern about copyright of materials; (v) preservation of materials for next generation through different languages; (vi) internet connection is also a problem inside developing countries. Interent is expensive and very slow. However, this study is trying to provide a possible soultion to reduce the mentioned problems.

Future Work

At present, there is a great desire for having updatable systems and latest technology among the developing countries. Due to future work, this paper is trying to focus on qualitative and quantitative point of views to overcome the limitation of the system which are include of copyright, skill of usage etc. This system will be used in future to support the users by adding virtual learning environment. Due to improvement of new technology in the society, the mentioned system will not provide all the services to

users, however according to future plan; the system will facilitated the services to address users' requirements.

In addition, text-recognition and e-contents are the future plan for library management system. Text-recognition means to translate English materials to Pashto and Dari languages and reverse of it because most of the people do not know about English materials. On the other hand, e-content is other plan for future, to provide a competitive environment for lecturers and students across the country to upload their materials in the noticed system and improve their knowledge. This kind of opportunities will provide competitive atmosphere. Furthermore, this study will highlight the current situation of libraries in Afghanistan. E-Ketabtoon will preserve the remaining valuable knowledge and research works to the next generation. Indeed, the authors hope that e-Ketabtoon will promote the digital book culture in Afghanistan and improve overall library management structure.

Acknowledgements

Conclusion

To sum up, paper-based library management system has more problems in Afghanistan. Currently, the libraries are inefficient, very slow in service delivering, no damage control, no preservation for next generation and lack of useful resources. This study has proposed a digital library management system known as *e-Ketabtoon* to reduce the current problems of library and to improve the educational system across the country. This system will improve the overall management system structure of library at universities. Furthermore, users will be able to access useful materials during class to improve their knowledge and skills via rural area connectivity and changing learning methodology across the country.

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