Development of an Online Digital Repository of e-Books and e-Journals for PSU-Urdaneta College of Computing

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Abstract – *One of the core functions of the Pangasinan State University is instruction. Thus, the University must strive to provide the best quality of instruction to its main clientele, the students. Due to the advent of online technologies, students tend to favor easier access to learning resources through computers and personal devices rather than using traditional books and journals. Realizing these, the researchers developed an Online Digital Repository of eBooks and e-Journals for PSU-Urdaneta College of Computing. This online digital repository allows the storage of various eBooks and e-Journals in PDF file format. Consequently, the students and faculty members can access these materials through their computers and mobile devices. This study is a developmental type of research where the researchers systematically designed and developed the product using tools and enhanced models that govern the development. The researchers determined the functional and non-functional requirements that could be integrated into the system and developed the Online Digital Repository of e-Books and e-Journals for PSU-Urdaneta College of Computing following the Scrum Methodology.*

Keywords – *E-books, E-Journals, Digital Repository, Online Repository, Scrum framework*

INTRODUCTION

Digitization is the process by which analog content is converted into a sequence of 1s and 0s and put into a binary code to be readable by a computer. Digital information is stored on digital storage media and can be delivered in a variety of ways. Digital Content can be browsed easily and can be searched, indexed, or collated instantly. Most importantly, it can be linked to a 'web' of other content, either locally or globally via the internet [1].

The expansion of global computer networks and high-speed access to the internet has led to a proliferation of digital content, delivered to the increasing number of computer users worldwide. There is a growing demand for immediate access to rich content and easily accessed, up-to-date information from different organizations. The development of digital repositories, e-resources, and online libraries has anticipated much of this demand.

In addition, there is a significant growth of various national digitization projects, especially colleges and universities, as the need for online resources had become very important nowadays. Technological Institute of the Philippines, Manila, conceptualized the development of online resources for the College of Information Technology Educations using various electronic applications due to the need for online resources as supplements in the learning experience of the students.

On the other hand, one of the core functions of the Pangasinan State University is instruction. Thus, the University must strive to provide the best quality of instruction to its main clientele, the students. Provision of quality instruction is not only dependent on the delivery of state-of-the-art facilities and competent instructors but also the provision of student learning support mechanisms such as the instructional books and journals in the Learning Resource Centers. However, due to the advent of online technologies, students tend to favor easier access to learning resources through computers and personal devices rather than using traditional books and journals.

Accordingly, there is a sharp increase in the use of electronic resources such as e-books and e-journals to support students' learning. Thus, the College of Computing of PSU-Urdaneta can leverage the use of e-books and e-journals if these were centrally stored and accessed by the students through any computer or mobile devices connected to the campus network.

Realizing these, the researchers developed an Online Digital Repository of eBooks and e-Journals for PSU-Urdaneta College of Computing. This online digital repository will allow the storage of various eBooks and e-Journals in PDF file format.

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Consequently, the students and faculty members can access these materials through their computers and mobile devices.

OBJECTIVES OF THE STUDY

The general objective of the study was to develop an online digital repository of e-books and e-journals for PSU-Urdaneta, College of Computing.

Specifically, this study aimed to:

1. To identify the functional requirements of the system, and
2. To develop the proposed system using SCRUM methodology.

MATERIALS AND METHODS

This study used the developmental type of research. Ricthey and Klein [2] define development research as the systematic study of design, development, and evaluation processes with aim of establishing an empirical basis for the creation of instructional and non-instructional products and tools and new or enhanced models that govern the development. User or functional requirements has been determined using structured interview before the development of the proposed online digital repository to create system models which are very vital in process of system development. In the actual development, Scrum has been used to guide the development process. Scrum is a framework for developing and sustaining software products where people can address problems while productively and creatively delivering products of the highest possible value [3].

RESULTS AND DISCUSSION

User requirements of the proposed online digital repository system

The user requirements of the proposed online digital repository were divided into Functional and Non-Functional requirements. Functional requirements of the system document the operations and activities that a system must be able to perform. Non-functional requirements detail the constraints, targets, or control mechanisms of the system.

Functional Requirements

The following are the Functional Requirements of the System

1. The system must have a Book Management module where faculty can manage information and upload e-books and e-journals.

2. The system must have a User Management module where the admin of the system can add, update, and delete user accounts.
3. The system must have a Viewer page where the user can read the e-books or the e-journals
4. The system must have a Search page where he can search e-books or e-journals using keywords.

Below is the use-case diagram which has been utilized to describe the main functions of the system. It shows the interactions between processes and to its users that are represented by the administrator, faculty, and students.
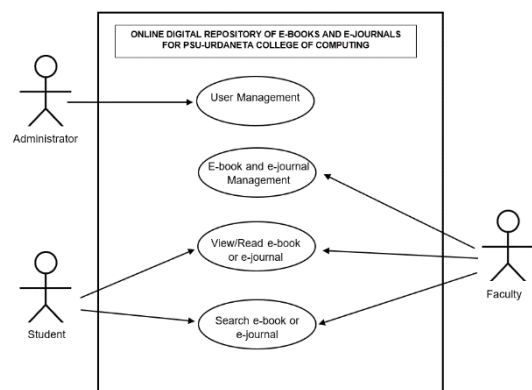

Figure 1. Use-case diagram of the proposed system.

Non-Functional Requirements

The following are the non-functional requirements of the system:

1. The system provides better system security by providing a login module, and by allowing the administrator to limit the access of other users.
2. The system improves the response time and throughput of the process.
3. The system improves data integrity by providing validations and exception handlings.
4. The system provides a better way of storing data by using a Relational Database.

System Development

Scrum was used as a guide during the development process. Scrum is an agile way to manage a project, usually software development. Agile software development with Scrum is a framework for managing a process. The Scrum model suggests that projects progress via a series of sprints. In keeping with an agile methodology, sprints are timeboxed to no more than a month long. Scrum methodology advocates for a planning meeting at the start of the sprint, where team members figure out how many items they can commit

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to, and then create a sprint backlog – a list of the tasks to perform during the sprint. During an agile Scrum sprint, the team takes a small set of features from idea to coded and tested functionality. In the end, these features are done, meaning coded, tested, and integrated into the evolving product or system. Below is the diagram of the Scrum software development.
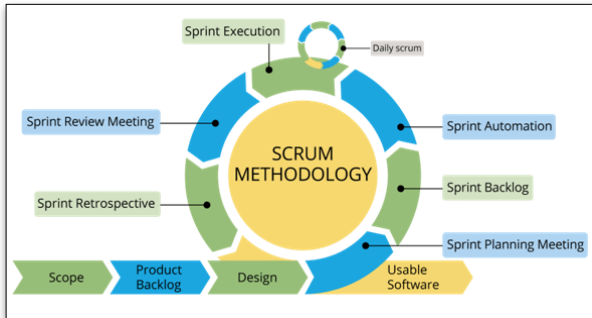

Figure 2. SCRUM Software Development Methodology

User Interface of Online Digital Repository of E-Books And E-Journals For PSU-Urdaneta College of Computing

The Online Digital Repository was developed using the ASP.Net platform and C# programming language. Bootstrap and JavaScript were also utilized to for the front-end part of the system. The following plates display the user interfaces of the online digital repository.
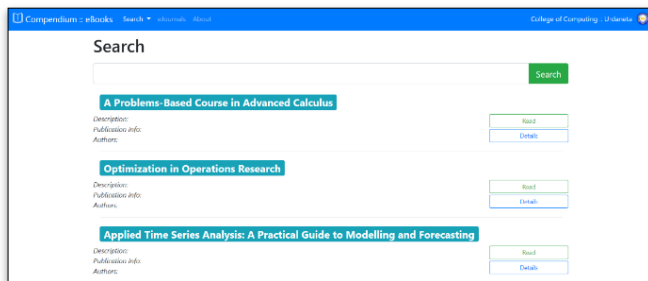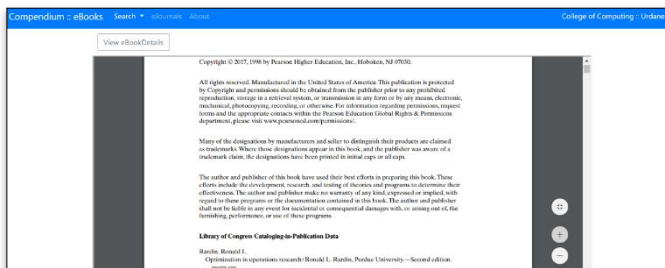

Plate 1. User Interface (Search Page)

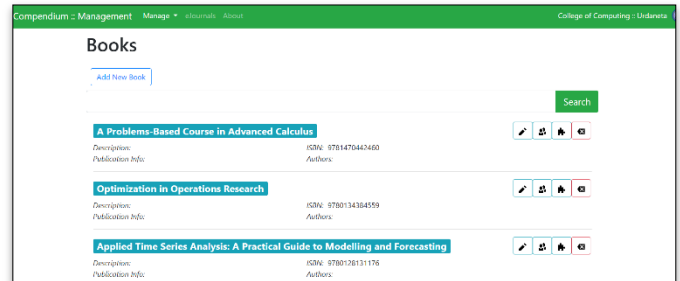Plate 2. User Interface (Read e-Book Page)

Plate 3. User Interface (e-Book Management Page)

CONCLUSION AND RECOMMENDATION

Upon the completion of this research, the following conclusions were derived:

1. The College of Computing of PSU-Urdaneta can leverage the use of e-books and e-journals if these were centrally stored and accessed by the students.
2. The integration of the functional and non-functional requirements makes the system more efficient, responsive and helps provide better security.
3. Scrum is a flexible methodology that enables the team to manage the project efficiently and provides a better way of building a product of this kind.
4. The development of the system leads to providing students online resources that can supplement their learning experience.

Based on the conclusions, the researchers recommend the following:

1. An online Digital repository of e-books and e-journals should be implemented to leverage the use of these digital resources.
2. functional and non-functional requirements should be carefully integrated to provide more efficient, responsive, and secured online systems.
3. SCRUM could be used to developed related projects as its best fits in the development of the proposed system.
4. A study about the implementation should be undertaken to identify the effectiveness of the system.

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