

Developing Online Bookstore to Facilitate Manual Process – UTP Case Study

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Abstract—Knowledge sharing enables the information or knowledge to be transmitted from one source to another. This paper demonstrates the needs of having the online book catalogue which can be used to facilitate disseminating information on textbook used in the university. This project is aimed to give access to the students and lecturers to the list of books in the bookstore and at the same time to allow book reviewing without having to visit the bookstore physically. Research is carried out according to the boundaries which accounts to current process of new book purchasing, current system used by the bookstore and current process the lecturers go through for reviewing textbooks. The questionnaire is used to gather the requirements and it is distributed to 100 students and 40 lecturers. This project has enabled the improvement of a manual process to be carried out automatically, through a web based platform. It is shown based on the user acceptance survey carried out that target groups found that this web service is feasible to be implemented in Universiti Teknologi PETRONAS (UTP), and they have shown positive signs of interest in utilizing it in the future.

Keywords—bookstore, knowledge sharing, online book catalogue, textbook

I. INTRODUCTION

EXISTENCE of online platforms to facilitate on campus book selling have increased throughout the years as the rise of agile information sharing and retrieval become critical factor in processes that occurs within campus proxy. Information dissemination which occurs traditionally have resulted in knowledge obsolescence as in today's world knowledge is rapidly changing as new innovation comes in. UTP is well known for its affiliation as a subsidiary of PETRONAS, Malaysia's only Oil & Gas Company, thus they must live up with the nation's expectation to be the leader in technology education. In order to successfully nurture creativity and innovativeness among its students, it must strive to focus on every aspect which relates to providing quality academic learning, which starts from dissemination and utilization of literature.

UTP Bookstore have used their own internal system on conducting sales and updating inventories which covers only the staff of the bookstore as the users. According to a survey conducted, lecturers review the textbooks for adoption

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purposes mostly from visits of the bookstore owner and students need to personally go to the bookstore to review textbooks. Thus, an online textbook catalogue is needed to simplify the process of textbook reviewing and at the same time it can be a platform to share the information. The book catalogue is hope to address 1) the current process of book purchasing in UTP and 2) the current process the lecturers go through for reviewing textbooks, which normally takes place at the beginning of each semester.

II. LITERATURE REVIEW

A software developer company states that an e-catalogue provides valuable information to the prospective customers about product specifications [1]. It facilitates the potential customers in locating the products they want and in a way they want it. It is an ideal and perfect product catalogue as it has no printing cost, no quantity or color restriction and no distribution cost. [2] describes that being self-updateable in a few simple clicks, the information in e-catalogue is always accurate and best of all it needs no reprinting. In addition, e-catalogue promotes your products by itself with enhanced interactivities, customer personalization and even enquiry shopping cart.

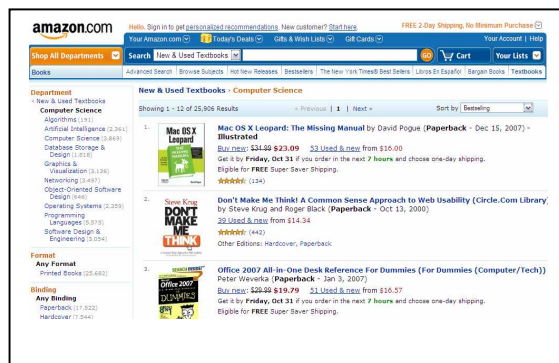


Fig.1 Amazon.com website

Amazon.com [3] is one of the most successful online shopping website which uses e-catalog to feature its products. Fig. 1 shows different types of books available are catalogued. The information available for each book includes the book cover at the left side of the main frame, plus the book description which includes information like book title, book author, book price, and number of books left to be sold and rating from customers.

Universities or institutions are the place where you can share or transmit the knowledge, thus they are known as knowledge-

based institutions. Apart from that, universities are the most popular place for computer application, so we could take the situation for granted by promoting the new computer applications/ services among the students [4]. The intranet facilities are normally provided for the universities students to help them in their studies. Most universities or institutions of higher education have built intranets, which facilitate students with their studies and their lives [4,5]. Online book catalogue could run on the university server and could be accessed by the lecturers and students using their intranet. Most universities are connected with LAN and this facility enabled the information to be shared and at the same time we could let the lecturers and students to practice e-commerce [5]. Few examples of e-commerce website for books are [6] and [7].

A. *University of Oregon Bookstore (www.bookstore.com)* [6]

The virtual bookstore in University of Oregon served about the total of 20,000 students, faculty, staff and alumni. The website was launched in 1998. Since the website is launched, the online sales are increased 10-12% annually. The competitive features are:

- Home page links directly to bookstore site, providing easy access/convenience for viewers.
- Weekly Featured Items section
- Staff Favorites section
- Textbook reservations
- Textbook requisitions for faculty
- Bestseller List of fiction and nonfiction

B. *University of Vermont(www.uvm.store.uvm.edu)* [7]

The online bookstore in University of Vermont served about the total of 9000 students, faculty, staff and alumni. The website was launched back in 1998 and it is owned by the university. The total online sales has grown from \$25000 in 2000 to \$548000 in 2003. The competitive features are:

- Offers online-only apparel promotions
- Textbook reservations
- Textbook requisitions for faculty
- Promotes bookstore site in-store by passing out free Web site [awards, coffee cups, and pins
- Textbook sales increased dramatically after they added online textbook reservation feature
- Sales Stats: Non-book online sales have increased 20-25% annually

III. METHODOLOGY

Initiation of this project starts with gathering all of the necessary requirements from lecturers, students, and bookstore owner in order to produce a website which is feasible to be maintained and meet user requirements. Primarily, focus is put more on research on various campus online bookstores which are already up and running. On top of that, a research on UTP's bookstore system is also conducted in order to understand the current process of book information dissemination within UTP proxy. In line with that,

questionnaires and interviews with target end users are found to be the most effective method to gather precise information from end users.

Four (4) elements are used as a guideline in developing the questionnaire for students and lecturers which are 1) Usefulness; 2) Ease of Use; 3) Attitude towards Use and 4) Behavioral/ Intention .

Based on the literature survey as well as data collection, the prototype of the system was developed.

Design paradigm begins with prototype design of the graphical user interface (GUI) layer and consequently outlines the back end (database and system architecture) system of the website which is only visible to the bookstore staffs which are the administrators of this portal. Construction of the prototype was modified according to the feedback of the end users, in order to produce an online book catalog which adheres to the required elements at the end of this project.

The prototype which results from the design phase is then evaluated by the students and lecturers as the end users and the evaluation results can be used to refine the requirements for the software to be developed. Iteration occurs as the prototype will be refined to satisfy the user requirements, while at the same time enabling the developer to better understand what needs to be done.

After designing the GUI design prototype, the website is then deployed on a web hosting in order to make it accessible via the net. The processes through the development are as follows:

- Configuration – The website is configured using a hierarchical configuration system. ASP.net uses a file-based configuration system. The configuration information is stored in XML format. During configuration stage, declaration, settings storing and retrieving the settings from the configuration files will be done.
- Localizing portal (using ASP.net application) - Localization is the process of using global application in a particular locale. This is achieved by supplying the culture information to the website.
- Connect portal to the database - The fresh installation of the portal was connected to the database by allowing the manipulation of a relational database which is a part of Relational Database Management System (RDBMS) by using Microsoft Jet 4.0. Jet allows multiple users to access the database concurrently.

A. *Pre-Implementation Questionnaire for Students*

The questionnaire designed to be distributed to the 100 students of various year of study, has enabled gathering of valuable data and information. From the tabulated data, it can be concluded that:

Only half of the respondents went to the bookstore in the beginning of each semester, and less than 5 visits per semester. With the presence of an online book catalogue, it will encourage more students to review textbooks online.

The survey also indicates 32% of the students purchase less than 3 books per semester, while only a minority of respondent actually purchases more than 3 books.

Most respondents are interested to purchase study related materials from the online bookstore, such as textbooks, reference books, and stationary. 24% of respondents are actually interested to purchase general books, computer gadgets as well as UTP Merchandise from this proposed website.

Focusing on used books market, more than half of respondents find information on the availability on a specific textbook via their friends, posters and through words of mouth. While a small group of respondents find that information through DC++, which is a free and open-source peer-to-peer file-sharing client software.

Most students are found to be accessing the UTP internal websites mostly within UTP compound. From the survey, it can be concluded that students wants to buy books but most of them do not have an initiative to visit the bookstore, and this might be because of the distance of the bookstore from their residents. Students currently could not gain any information regarding books from the bookstore, so they prefer to find the information from DC++. Based from this argument, the online book catalogue is needed in UTP to allow the students to review about the books and to check whether the book they want is available or not.

TABLE I SOME OF THE QUESTIONS ASKED TO THE STUDENTS IN THE QUESTIONNAIRE WITH RESULT

Questions	% of students
Pay < 5 visits to the bookstore in the beginning of the semester	50%
Purchase < 3 books per semester from the bookstore	32%
Purchase > 3 books per semester form the bookstore	5%
Use other web based medium to buy books	70%
Need a book catalogue for the bookstore?	95%

B. Pre-Implementation Questionnaire for Lecturers

The questionnaire is designed to gather some requirements from lecturers. There are 40 set of questionnaires distributed to the lecturers. From the tabulated data, it can be concluded that most lecturers stated that they encourage their students to purchase the latest version of a textbook, rather than used books which versions are outdated. Almost all respondents' states that they prefer to review the actual textbook personally before adopting it as a course text/reference books. Most respondents are interested to purchase study related materials from the online bookstore, such as textbooks, reference books, and stationary. Half of respondents are actually interested to

purchase computer gadgets and UTP Merchandise from this proposed website. In their opinion, the current process of reviewing textbooks could be improved. By having a book catalogue that could be accessed through the university intranet, the lecturers do not have to wait until the book sales person to come and approach them in order to get the new version of textbook. The problem might occur when the lecturers are not around during the visit of the sales person. So, they have to make a visit to the bookstore in order to check on the new version of books available.

The designs of the questionnaire for both categories of respondents (students and lecturers) are made to capture all the requirements for the online book catalog. There are two (2) parts of questions being asked. The first part of the question is designed to gather information related to the respondents' background. There are 12 questions being asked to the respondents in order to understand their perspective and idea of the online book catalog and at the same time to promote the use of the platform to facilitate the process of reviewing the books.

TABLE II SOME OF THE QUESTIONS ASKED TO THE LECTURERS IN THE QUESTIONNAIRE WITH RESULT

Questions	% of students
Prefer students to get the latest book edition	90%
Prefer to review the textbook before adopting them as the course reference book	95%
Need a platform to improve the current process of reviewing books	98%

C. Analysis for Pre-Implementation Questionnaire

Both students' and lecturers' questionnaires have enabled gathering of valuable data and information. The result from both groups obtained can be compared in order to find hidden patterns on opinion and preferences of both parties, as well as enable the creation of a useful website that will benefit both. From the tabulated data, it can be concluded that both groups of respondents are interested to purchase more than only textbooks for academic purposes. They are both keen on finding any other things on the website, such as stationeries, UTP Merchandise and computer gadgets. Both students and lecturers are found to be accessing the UTP internal websites mostly within UTP compound. This information enables the final decision of managing the website as an intranet rather than internet during the implementation phase.

Analysis on both groups' data has enabled the identification of critical factors that effect the user perception of the website once it is implemented. It is important to recognize main behaviors and interpretation of both groups, as the website need to cater to two different groups which objective and use

of the proposed website will be dissimilar.

IV. SYSTEM DESIGN AND ARCHITECTURE

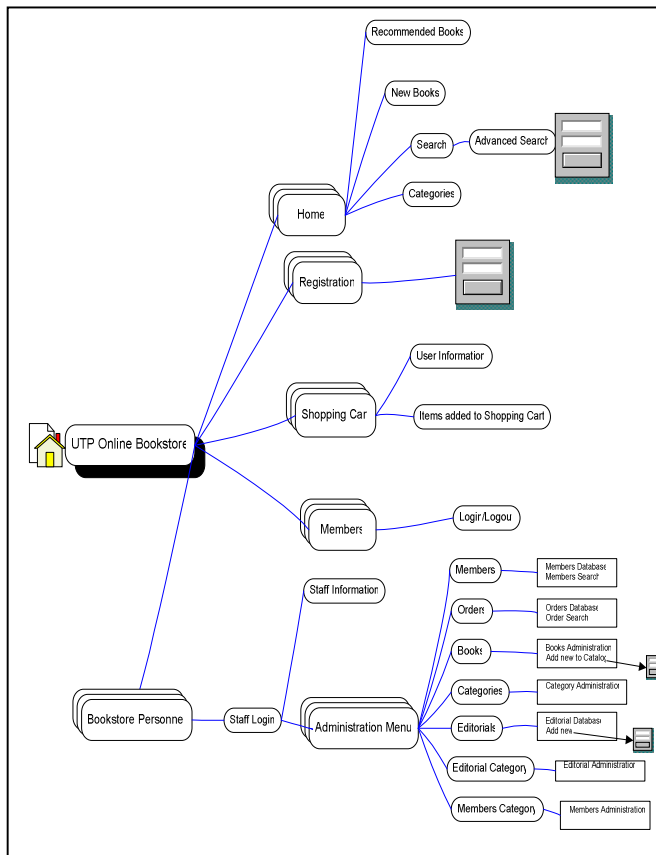


Fig. 2 UTP Online Book Catalog Flow Diagram

Fig. 2 provides the full view on the system flow of the online books catalog. As demonstrated, users are exposed to five (5) different links which are the main functions of this website through the home page. To be an authorized user, users may register themselves through the registration link provided by filling up a form. When any registered user clicks on the 'Shopping Cart' link, they are able to view the items that they have added on to their personal shopping cart.

Registered users may log in directly by clicking on to the 'Members' link and enter their user name and password to access the portal. Once they successfully logged in, they can view the items they previously add to the shopping cart in which they have not collected from the bookstore.

Second part of this website, which is the crucial part, is the back end system for administrations. Once a certified staff is registered, they will view a list of administration menu which are members, orders, books, categories, editorials, editorials category and members category to enable them to administer different sections of the website.

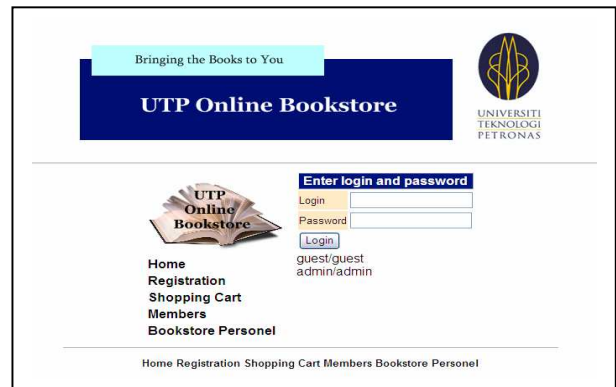


Fig. 3 Login page



Fig. 4 Book administration page

After all functions are developed, each work unit has to undergo a system testing where each unit has to be integrated to ensure its compatibility. The portal deployed will need to undergo the relevant user acceptance testing before the live run takes on. This is to assess system effectiveness and if it meets the requirements identified. The user acceptance test takes place as soon as the portal is running. In doing this, the portal will be running for a period of time and the usage will be monitored. Based on the results from users, the finding will be analyzed and results on the user acceptance test will be discussed.

V. RESULT AND DISCUSSION

A. User Acceptance Result

TAM [8,9,10] is used to evaluate the acceptance of the end users toward the system developed. The criteria that are going to be evaluated are: 1) system usefulness, 2) system attractiveness and 3) ease of use of the system.

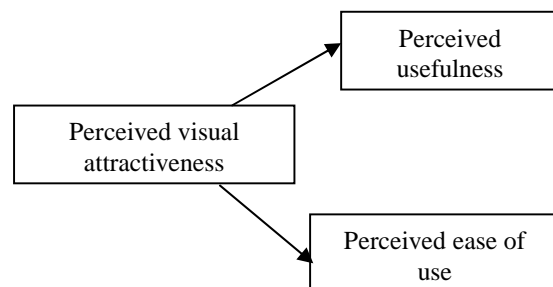


Fig. 5 Revised TAM for Online Book Catalogue (adapted from [8,9,10])

Perceived Usefulness:

From the survey that has been carried out by the total of 140 respondents (100 students and 40 lecturers), 50% of the respondents think that the system is very useful and 20% think that it is useful when it comes to searching the textbook to know the availability status without having to travel to the bookstore itself.

40% of the respondents strongly agree and 23% agree that the portal has improved the current process in obtaining information on books, booking of books and reviewing books.

Perceived Ease-of-Use:

The respondents found that it is very easy to understand the system, in terms of registration of the new user and also the system navigation. 63% of the respondents agree that the system is very user-friendly.

Perceived Visual Attractiveness:

The design of the system interface which is simple could attract the user to use the system. 55% of the respondents agreed that the design of the interface which is attractive makes them willing to use the system again in the future.

Respondents have tested the portal and they found that this portal is feasible to be implemented in UTP. This portal can significantly increase the sales of books as the respondents agreed that this online book catalog enabled them to obtain information in a way they can not before and the attractiveness attracted them to re-use this portal in the future.

Respondents also agreed this portal establish a closer connection between students, lecturers and the UTP Bookstore, and this way this portal have upgraded the system of information sharing and retrieving amongst these three groups.

VI. CONCLUSION AND FUTURE WORKS

Information sharing is vital within the campus area, as well as for businesses which cares about reaching their consumers effectively. The same thing applies to UTP, as to be in line with other successful campuses around the globe; they must acquire latest technologies available.

Online bookstores has existed and being utilized around the globe by campuses since 1994. In line with UTP's mission to be the leader in technology education, new technologies and ways of doing things which are found efficient needs to be developed. In this case, this project permits the enhancement of information sharing by the UTP Bookstore to all UTP citizens.

Web prototype gives a basic idea of how the outcome design of UTP Online Bookstore will look like, based on the research being done. It acts as a guide for developers to create an integrated web platform suited to user's requirement, user-friendly and most important, its functionality. These user requirements can be gathered through various research

methodologies, namely survey questionnaire and interviews.

Basic functionalities of this website are login page, registration page, book search engine, shopping cart and bookstore personnel administration area which includes book category, books administration, member's administration and member's personal page.

Adhering to the objectives, this portal is dedicated to assist and improve the current process students and lecturers went through in finding information about books available at the physical UTP Bookstore located within the campus area. Simple language and interface is being used to ensure quick and easy understanding by users to enable them to get the information they need immediately.

This research project could be extended so that in the future the lecturers and students could purchase the books online. The concept of the e-commerce and security need to be apply in order to make sure that the system is secured while they are doing the transaction.

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