TAGUIG CITY UNIVERSITY
COLLEGE OF INFORMATION AND COMMUNICATION TECHNOLOGY

ANDROID BASED LIBRARY SMS FOR BOOK INQUIRY AND RESERVATION WITH DATA ANALYSIS OF TAGUIG CITY UNIVERSITY

A Thesis

Presented to the College of Information and Communication Technology

Taguig City University

Taguig City

In partial fulfillment

of the requirements for the Degree

Bachelor of Science in Computer Science

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2019

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Chapter I

Introduction

New tools of information technology have absolutely changed the role & responsibilities of librarians. A number of studies have been conducted to explore the problems faced by librarians. While the role of the school library remains constant, its design, platform, strategies and tools could change as technology changes. With the changes of lifestyle and demands of people, and many other factors, these plays as inconvenience for the students. From being too far or running out of time to catch the library open. Traditionally, students will rush, looking for a certain book, and sometimes, it is not available. And having no assurance if the given book will be available on time at the library. Students are having a hard time.

By adapting technological advancement, it will offer us many flexible and convenient features. Allowing both librarians and library users of the institute to maximize time and efficiency. This development will give us all the needed information about students and books. It will also help us track the availability of our reading materials.

Project Context

The personal lives of most of us is highly dependent on the technology that people have developed. Technology has advanced with years and it has changed the way we purchase products, the way we live, the way we communicate, the way we travel, the way we learn and so many changes have been brought about by these continuous technological advancements. As people's demands and life style change, the demand for advancing the type of technology we use

is high. In our society, in every part of the world, technological advancement is one of the most important aspect of progress. It is a necessity to move along with its changes. Technology is an ever-changing world, and if we never adapt on the fast phase of its development, life may offer us a hard time.

The library is regarded as the brain of any institute many institutes understand the importance of the library to the growth of the institute and to its population. It develops the important habit of reading among the students. It plays a great role in the life of people by serving as the store house of knowledge. It serves as a foundation of students to work hard, persevere, and gain knowledge on their own.

The TCU Library aspires to be that foundation that a lot of students need, but as the human society progresses, it cues the TCU library to adapt and automate their current system of procedure to be in-sync with today's technology. Underlying problems such as, not being able to track which student borrowed which book, when it is due, and if a student borrowed a book and have not been penalized will be one of the issues that the system will have to face. But on the bright side, it will also allow the Library to be more lenient to lending books to students, as automating the procedure will diminish any problems that might arise, such as unreturned books, vandalism and damage to TCU Library property.

Purpose and Description

In the race of this "Digital (Computerized) World" starting from a small organization to a large size organization each and every one is opting to computerize systems for faster and more secure access of data. Using a computerized system has a lot of benefits, which we, in the modern world, can't ignore. An effective management system is a crucial factor in successful working of Android based Library Management System in a school. Until

recently, they have to work through such inefficient and potentially error-prone means as processing manuals, just to gather up the information and also to work smoothly. And that's before they've passed it on to the students and faculties of Android based Library Management System where it will re-enter, hopefully with accuracy. User can check for books without visiting the library. They can get reminders on their phone. For SMS Autoreply, users don't need active Internet connection.

Objective

The objective of the study is to develop an Android based application that will help the students to inquire and reserve books without the hassle of going to the library or running out of time. The application will also help the not just the student, but the whole library to request needed but unavailable books. It will also be used to maintain records of user details such as user penalties, user borrowed books etc. This system will also use the advantage given by SMS. Another objective of the study is to use the cluster analysis which will give the library management, the information about which books are more frequently to be sought after, which are the least likely to be requested for. Which in turn will give the management staff a better overview of book ratings.

The purpose is to develop and evaluate an Android based Library SMS with Data Analysis, that can be used to inquire and reserve books, which will help both the students and library manager to keep a constant track of book availability. This SMS feature will notify users who have requested a certain book when it is available to be borrowed or if it's read to be picked up. This system will focus not just on basic operations like inquiring, borrowing, and reserving books, but also recording data and information of most searched or inquired books, that in return can be used to start a petition to provide a copy of book if it is unavailable.

The software features well thought-out, attractive interface that will help the user learn navigate and control the application without the difficulties of understanding each one of its functions. It will make the process of borrowing books more user-friendly and easier, hence, will not make the users discouraged in having the ability to learn outside of classrooms. Most libraries in the Philippines face that issue, of not having a flexible and versatile procedure when it comes to allowing which books can or cannot be borrowed by users. Usually due to the fact, that the transactions as such, are not automated and are done manually by hand, and recorded in books which deteriorate over time.

Scope and Limitations

Scope

The study is about the Android Based Library SMS for Book inquiry and reservation with Data Analysis for Taguig City University. If implemented in the future, the system will reduce the time and effort of the users in library inquiries. It will also analyse the data gathered through the system to improve, and utilize such information as to which books are most used, which are sought after often, and which books tend to usually get borrowed. The system will also record most searched-but-unavailable books that can help the library management to start a petition for the provision of the given book title. This is one integrated system that contains both the user component and the librarian component. Also, with the use of SMS, users can send message on dedicated number for information about books, penalties, due date, issue date etc.

Limitations

- The pay salary of the Library staff is not covered in the system
- The system needs direct connection to the internet to update the list of books

- Applications for a Library card is not covered in the system
- Library staff still has to undertake a couple of steps required for learning the automation
- Study is limited to a proposed plan of development Library Book Inquiry and Reservation for the University of Taguig City

Chapter II
Related Literature

Foreign Literature

According to the G.o.J. Center of International Cooperation for Computerization, "Survey of information and communication technology utilization in Philippine public high schools' preliminary findings." 2015. Alarming situations in library management systems are often neglected and not prioritized. The majority of the schools claim to have used computers for educational purposes for at least two years and teacher-to-computer ratios appear slightly better, with almost a quarter (24.2 percent) of the schools that allow teacher access to computers having one computer for four or less teachers. Almost half of the public high schools, however, have not computerized their library database, assuming that they have one in the first place. The question of digital divide has appeared in library and information science literature frequently as impacting negativity on the provision of library and information services.

From the work of S. M. Mojapelo and D. Luyanda, "Information access in high school libraries in Limpopo province, south Africa," South African Journal of Libraries and Information Science, vol. 80, no. 2, July 2015. Findings in South Africa established that access to information by teachers and learners is a daunting challenge in the majority of the schools for only a few schools have functional libraries. Study conducted in assessing school library information resources by secondary school students in Morgoro municipality in Tanzania revealed that secondary school students face many constraints in using school library

including lack of current and up to date reading materials, restricted reading hours, lack of sitting facilities, and lack of informational professional/ librarian for processing materials.

School libraries are a vital part of the education system. Researchers agree that information resources are imperative for curriculum support. Equitable access to information resources by teachers and learners is absolutely essential to enable them to execute their curriculum-related tasks. Principals have been using management information systems to improve the efficiency of administrative services. Research indicated that although technologic infrastructures of elementary schools are insufficient, school management information systems have an important contribution to school management which includes library organization argues that without libraries and dedicated school, or teacher/librarians, the millions spent on book donations and literacy projects might be wasted.

As mentioned in the book “Application of information communication technology to the management of library’s readers desk,” DESIDOC Journal of Library and Information Technology, vol. 32, no. 6.” By O. Olaniyi, A. Omotosho, E. Oluwatosin, O. Towolawi, and G. Grant-Ezeronye, 2016. Inevitably, technological advancement heals the glitches in library management system. To be effective in providing information in this digital age, it is necessary for libraries to reinvent themselves through heavily utilizing information and communication technology in most library services such as storage, processing and dissemination of information. An automated library’s readers desk management system, a modern innovation in Nigeria, is designed to help in the circulation registration of processed books and register users using barcode technology and biometrics. According to another study, also showed that 72 percent of librarians opined that acquisition of digital materials required more collaboration including IT developments and legal developments. Since library support is an integral part of

quality education and a vital service that should be available to all students whether on-campus or off-campus, by utilization of ICT, librarians have sought providing services to distance learners that are equivalent to those available to on-campus learners [15]. Koha Library Integrated Open Source software, an integrated software system with all the required models is implemented in Chemistry Library, Bharathidasan University. suggested that the utilization of this system in library management system automation is viable for small, including school library to very large libraries. The Education Library Information and Technology Services (ELITS) of the KwaZulu-Natal Department of Education made significant contribution to the development and resourcing of school libraries in public schools.

Local Literature

In the study of Department of Education, "ICT implementation plan for elementary schools (ict4es) DepEd master plan for elementary education." 2016. Prospects on emerging technology alleviate the burden of dealing with enhancement of quality basic education. Supporting a goal of sustained, broad-based development, the Philippines government has developed the Philippine Digital Strategy (2011-2016) as their ICT blueprint. The Philippine Government has shown serious commitment to ICT in education by announcing a series of initiatives to apply ICT in teaching and learning. Aligned with ICT4E Master Plans the government envisioned Philippine education in 21st Century Education for All Filipinos, Anytime, Anywhere.

As mentioned in the Book of "Bringing libraries into the ICT policy conversation in the Philippines", July 2015. the Philippines government has developed the Philippine Digital Strategy (2011-2016) as their ICT blueprint. The Philippine Government has shown serious commitment to ICT in education by announcing a series of initiatives to apply ICT in teaching

and learning. Aligned with ICT4E Master Plans the government envisioned Philippine education in 21st Century Education for All Filipinos, Anytime, Anywhere.

The Department of Education believes that ICT plays a major role in creating a new and improved model of teaching and learning where education happens anytime, anywhere.

In order to achieve that vision Five-Year ICT Strategic Plan which aims to, completely integrate ICT into the curriculum, including the development of multimedia instructional materials, and to establish the necessary ICT infrastructure and applications has taken place. At the elementary level, ICT integration in existing curriculum contributed to meeting the student performance targets. Also supported the fact that there is a great need in the use of advanced science and technology in order to enhance teaching skills. Since the integration of multimedia learning environments, simulations and computer-based laboratory analysis tools foster superior math, science, and language skills. Bridged communication and collaboration between and among students, teachers, educators and outside experts take place easily. Some researchers also believe that ICT fosters self-direction. Students learn to initiate their own learning or develop better understanding by asking questions and seeking out answers using a variety of resources. Similarly, asserted that the progressive increase in the use of ICTs in education has drastically changed teaching/learning process" He further stated that the head of education has been elected by the penetrating influence of ICTs. ICTs has undoubtedly, impacted on the quality of teaching, learning and research in various educational institutions.

In concrete terms, ICTs can enhance teaching and learning through its dynamic interactive and engaging students in learning, helps to relate school experience to work practices, enrich and deepen skills, help to create economic viability for tomorrows makers,

contribute to radical changes in the school teaching process, and provide opportunities for connection between schools and the world.

According to Newsbytes.ph, DepEd unveils online library locator map in public schools." Online 22 July 2015. Different type of libraries exist to serve different type of needs, since no single library can contain the information sought by every potential user. There are several types of libraries: public libraries, school libraries, academic libraries, special libraries and government libraries. Public libraries and government libraries often serve the general public, however, the government libraries are specially designed for governmental departments and agencies. Academic libraries serve colleges and universities, their students, sta_ and faculty. Larger institutions may have several libraries on their campuses dedicated to serving particular schools such as law and science libraries. Special libraries serve various organizations, industries and governmental agencies.

On the other hand, school libraries are usually part of a school system, and serve students between Kindergarten and grade 12. It is a fundamental resource for supporting students learning, and a key support for teaching. Unlike most public libraries, school libraries uphold the teaching-information literacy skills wherein the school librarians can collaborate and co-teach with classroom teachers by knowing what topics teachers focus on and when. School libraries are places for learning and thinking, and play a key role in supporting and developing enjoyment of reading and multiple literacies which equip students with life-long learning skills and develops the imagination, enabling them to live as responsible citizens.

From the previous school year 2013-2014, the Department of Education (DepED) registered 5,602,327 public secondary schools' enrollees which contained in only 7,913 total public 10 schools in 17 regions. As of June 2014, the agency has 9,855 registered public schools with libraries while there are 188 library hubs in divisions nationwide [25]. School

libraries must contain recommended size of the various collections of 5,000 titles for the secondary level to support the curricular offerings of the school for an enrollment of less than 1000 students and twenty percent of the total collection shall be published within the last ten (10) years.

Foreign Studies

As Per R.Dinesh*, S.R.Arun Pravin*, M.Aravindhan*, D.Rajeswari, "Library Access System Smartphone Application Using Android" December 2016, The Library Access Application helps the patrons to access their required information and queries without computers or the librarians but through their android devices which saves their time and energy. The Application retrieves the information stored in the library database through the library server for example checking whether the books are available in the library or borrowed without intervening anyone. User's access of library will be stored in the database for suggestion during a search for books. Due-date of the borrowed books from a library will be intimated by the app as a notification prior to the deadline. Users are privileged to suggest books for the library and they are notified about their suggestion, by the Librarian. This paper brings a new idea of the public to access the library.

Base on the study of Milind Deshkar , Saylee Betawar , Shubham Amale , Nikita Harode , Rakshat Jaiswal *2ndInternational Online Conference on Advent Trends in Engineering, Science and Technology "ICATEST 2016", 03 April 2016* Traditionally, library systems are implemented manually which is very costly, time consuming and tedious. Academic libraries in engineering institutions are prominent information organizations and play a crucial role in fulfilling the needs of the pedagogy. A college strengthens its educational level through the advancement of its library. Teachers, laboratories and libraries are important components in

imparting effective engineering education to them. The aim of an engineering college library is to facilitate the engineering professionals in enhancing and updating their knowledge and skills, and to provide them information regarding new innovations, views, theories, engineering education, and research. This will in turn enhance the quality of teaching and upgradation of student's results. The primary role of engineering college library is to collect and organize recorded information in engineering and allied subjects to meet the needs of users. Information and Communication Technologies are increasingly used to collect, store, retrieve and promulgate a great amount of information to help engineering professionals. Information Technology has a profound impact on library operations, Information resources, services, staff skills development requirements and users' expectations. Information technology has virtually unlimited potentials for variety of useful applications in libraries as it significantly contributes to the improved quality, increased productivity, more efficient operations, better resource sharing and more effective services to the users. The purpose is to ease the transactions in the library, i.e., lending of books, storing of books, search engine for books, manage members of the library and secure the library system. Today the success of modern library is increasingly dependent on the most effective utilization and strategic management of new technologies in libraries. It is analyzed the awareness of the faculty and students in engineering colleges regarding the availability of IT components and their level of satisfaction on the basis of our survey.

In the study of Automation of Library Services For Enhanced Users' Satisfaction Of Information Resources In Academic Libraries In Nigeria Conference Paper · September 2017 Citations 2. The advancement of Information Communication Technology has brought change to the operations of library services in many academic libraries in Nigeria, from traditional methods to a modernized way with the computerization of library activities. The paper looks into

library automation for enhanced users' satisfaction of library services via acquisition, circulation, online Public Access catalogue, Catalogue and serial control. The paper would help academic libraries in Nigeria who have partially automated or those that have not yet automated their library activities to fully embrace it so as to satisfy the information of needs of the users by providing efficient library services. It also highlighted some rationale and requirement for the successful implementation of library automation in academic libraries in Nigeria and how best to tackle the challenges confronting libraries in an academic setting. It concludes by urging the management/Stakeholders of all the academic libraries in Nigeria to carefully plan and implement high quality library and information services due to the growing demand of users and the changing social and technological environment of the present era.

Local Studies

According to the study of Analee E. Mayo, Department of Physical Sciences and Mathematics University of the Philippines Manila February 2016 Over time, information and communication technology (ICT) have shown unprecedented changes to the services ad operations of modern libraries. Today, carrying out library task and services through information and communication technology (ICT) are established to complement all types of libraries, but still unsubstantiated in the majority of school libraries. The Library Information Library Information System aids in borrowing and returning books and reading materials via shopping cart and provides an organized tool in performing library tasks and services in public high schools from basic to complementary. The librarian can add newly acquired library materials in the online catalog .Library users can easily track reading materials usage and availability through the system. The librarian can monitor users overdue books and reading materials

borrowed by users. Inventory Report generation in Portable Data Format (PDF), for submission purposes, can be done by the system without manual counting.

As per Mr. Chito N. Angeles of “UP Diliman Libraries In Transformation A Vision Paper For The University Library” Diliman, August 7 2017, Traditional libraries had books at its center while a transformed library is centered around the user experience. The transformation in the physical space in the library is not just an architectural restatement but a reconceptualization of the library as physical space to reflect new functions and uses.

Libraries in UP Diliman must have flexible space designs to allow for changing uses. Social learning spaces, such as information commons, discussion rooms, meeting rooms, and makerspaces are collaborative and creative spaces designed to stimulate the imagination of students, faculty, and other library users.

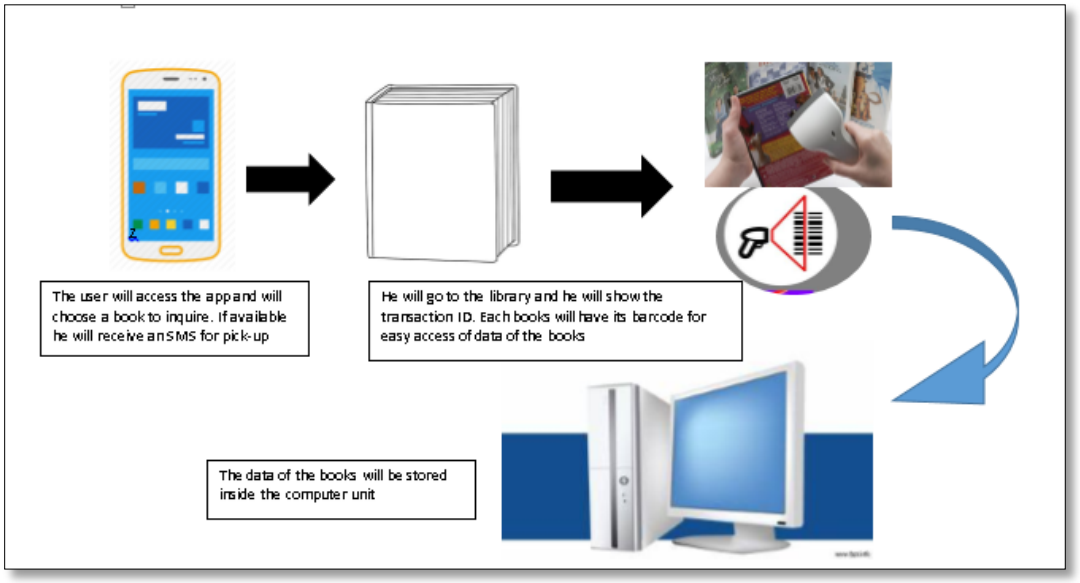
In the study of “De La Salle University Library System Migration: a Strategic Decision Library automation” at DLSU-Manila,2017 had undergone a gradual but steady development. It started in 1985 when it implemented the MINISIS software/Hewlett Packard 3000 hardware package. The system was able to create 11,000 bibliographic records for Filipiniana and Reference collections. The massive hardware maintenance problem led to a management decision to phase out the system in 1988. At the later part of the same year MINISIS was replaced by its micro version known as CDS-ISIS. The software with one stand-alone XT computer facility automated the indexing of articles from more than 100 locally published periodicals including newspapers, magazines, and journals. Additional databases were created as the number of computers increased. The index became searchable simultaneously by several users when the computer facilities were networked in 1992. In the same year the CD-ROM technology was introduced for information retrieval of selected indexes and abstracts.

In October 1990, the DIALOG Information Retrieval Service allowing remote access to more than 400 databases of indexes and abstracts from a broad scope of disciplines was introduced to the academic community. The dial-up ordering and the conventional delivery mode of full text articles and documents were made possible through this service. DIALOG online service ceased in 1998 and was replaced by First Search OCLC. In 1993 the University Library subscribed to the country's first online remote service, HERDIN (Health Research and Development Information Network) that provided access to about 8 databases that cover ASEAN and Asia-Pacific documents and hosted by PCHRD of DOST. The following year the INTERNET, a global information facility, became available in the university enabling the library users to avail the E-mail facility. The same year the ISIS OPAC was mounted in the local area network providing access to book catalog and articles index.

Chapter III

Technical Background

Block Diagram



Android based library SMS for book inquiry and reservation with data analysis of Taguig City University will follow the block diagram above. The first step will be the user who will access the app using his smart phone and reserve a book for it, he or she will receive a SMS if the book is ready for pick up. The second step will be user will go to the library and show the transaction to get the book he borrow and the librarian will scan the barcode on the book to gets its data and it will be stored in the system for tracking the book.

Figure 1 Android Phone This gadget is one of the important things because the user can access the library using his/her phones. The phone is handy to use, the phone is easy to access. And this day's phone is one of the most have gadgets we owned. It contains all our personal data a swipe and touch can access all our data in just a matter of seconds or a minute. So, as we think of a system, we will be doing we want to use android phone to easy access the Library.

Figure 1 Mobile Phones

Figure 2 Computer Set This computer set will be used as the main equipment of storing data. Fetching, reading, updating some information inside the system. This is the head of the system because all the transaction that we will be done by our system is all in the admin side or back end of the system.

Figure 2 Computer Set

Figure 3 Bar Code barcode is a visual, machine-readable representation of data; the data usually describes something about the object that carries the barcode. Traditional barcodes systematically represent data by varying the widths and spacings of parallel lines, and may be referred to as linear or one-dimensional. It will help to record books using this bar code that will be put in every books

Figure 3 Bar Code

Figure 4 Barcode Scanner This will be used as an electronic instrument to read the bar code and collect the data needed. This will be the reader of every

barcode that is in the books and accessing all its data such as book title, its category and the like.

Figure 4 Bar Code Scanner

Java – This programming language will be used in developing the system. Android Studio for mobile development and Netbeans as back end of the system are all java integrated program.

mySQL – The database that we will be using in gathering all the data needed.