

E-SEARCH: AN INTEGRATED LIBRARY SYSTEM

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Abstract

A library is a place where books are collected and kept safely. Library also provides services such as the internet and computers. The advancement of technology made man's life easier yet Cadiz City Public Library is still using the manual way of transaction such as lending and searching of books and recording the attendance of patrons. The researcher used a descriptive method to assess the problem and needs of the end-user and Rapid Application Development in the development of this study. The researcher used Convenience Sampling Method and Purposive Sampling Technique and a total of one-hundred two respondents (102) were selected to participate. The researcher developed E-Search: An Integrated Library System to upgrade and improve the library transactions in terms of its services and functionality. The researcher used McCall's Software Quality Model Criteria to determine the quality of the developed system, Computer System Usability Questionnaire, and Self-made Questionnaire to determine the acceptability in terms of functionality and user requirements. Based on the findings, the developed system is of average quality since it passed the different criteria. It also shows to be useful and provides satisfaction and ease of use to the users thus, Cadiz City Public Library agrees with the system usability.

Keywords: Integrated Library System, Library Automation, e-searching.**Introduction**

Technology is gift of God. It is the mother of civilizations of arts and sciences [2]. The word technology is the most important advancement, a necessity in bringing about progress as we move along in this computerized world. In effect, these changes made man's life easier and more convenient. The relationship between the library and the computer is constantly changing that the use of computers contributes to the way man learns and communicates. It is easy in this world to strive for changes and since the library is no different from any firm and institution, considering the use of a computer to perform a given task will be efficient. The fast phased technology attributed a lot to the improvement of the library system [1].

Library assumes a really essential role in supporting the instructional exercise programme of the institute [3]. The library can be the collected works, the building housing that collected works, or the association as an entire, but a lot of people only the first definition matters; the other senses of library are subservient to the collected works [4]. In a more traditional sense, a library is a collection of educational materials such as books. This collection and services are used by people most commonly by a student who cannot afford to purchase educational materials or those who need professional assistance with their research. Thus, libraries are considered the center of information and references. In line with this, Cadiz City Public Library, located in Cabahug St. Brgy. Zone 3, Cadiz City, was the only public library that caters almost to the schools and other citizens in the Cadiz area. However, the said library had only a few personnel and they were using the logbook as

their medium in recording the information of the incoming books as well as the books borrowed and returned by the borrower. They checked the books one-by-one depending on their classification and location every day to verify if how many books were left and are still available for their clientele. As a result, the process of the transaction was quite inconvenient to their part and their clientele in the sense that it takes them too much effort and time, approximately one (1) hour, to monitor the incoming and outgoing books.

Through E-Search: An Integrated Library System, the inconvenience in recording the transaction, searching of books, and the attendance of patrons inside the library had been lessened with the following features; automating the process of transaction, securely stored the information of the books and borrower in the database, returned and available in a sense that it would automatically record every transaction and provide the number of books available, searching features for the users to easily identify and locate the books they need as soon as they enter the library. The study would not only convert the manual way of the transaction into a computerized one but also the barcode scanner had been integrated into the software product for more efficient result. The system would scan the ID of the borrower and also the barcode of every book inside the library. It lessened the time and effort allocated by the librarian or staff in every transaction and it also gave convenience to the researcher and borrower in a sense that it automatically displays the information needed by such. The system was also capable of several settings like the penalty and the loan period of the borrowed book. The staff would no longer have to

input the due date of the borrowed book rather, the system would automatically set its due date. This study was also integrated with the attendance monitoring of patrons visiting the library.

Objectives of the Study

This study aimed to develop an E-Search: An Integrated Library System that would improve the process of transaction inside the Cadiz City Public Library and could provide convenience to the student in searching for books.

It specifically aimed to determine the quality of the developed system based on the McCall's Software Quality Model Criteria, evaluate the system based on Computer System Usability Questionnaire, determine the level of performance of the new system, develop a system that would automate the borrowing, returning, searching and attendance of the patrons, generate reports of borrowed books, returned books, attendance of patrons per month, list of Books and, list of Borrowers.

Materials and Methods

The Rapid Application Development Model was used in the development of E-Search: An Integrated Library System, because after the data being gathered and analyzed, the researcher focused on the iteration and feedback of the user to the presented features system until the desired outcome reached.

This study was conducted to assess the existing problem and needs of the end-user hence the researcher used the descriptive method.

The researcher interviewed about the current system being used and the flow of their transaction. The respondents gave the relevant information of data needed by the interviewer to be able to request and suggest how the system works. We ask for the job of each user. After that, we created the use case and the work breakdown structure of the system on each user we created the screen design and the relationship diagram.

The researcher used Convenience Sampling Method and Purposive Sampling Technique. It relies on the purpose and availability and convenience of the users.

Table 1: Respondents of The Study

Respondents	Number of users	Distribution Sample
Librarian	1	1
Circulation Staff	1	1
Patrons	100	100
Total		102

Table 1 shows the sample size used for this study which is one hundred two (102) persons composed of the following: one (1) librarian and one (1) circulation staff and 100 patrons. The purposive sampling technique was used in determining the sample size for the librarian and circulation staff. However, the convenience sampling method is used in determining the sample size of the patrons according to the convenience of the researcher and the patrons visiting the library.

The researcher conducted an interview with the Cadiz City Public Library personnel in the initial gathering of data information wherein a self-made questionnaire was provided.

Part I determined the quality of the developed system based on McCall's Software Quality Model.

Part II evaluated the system based on Computer System Usability Questionnaire.

Part III determined the level of performance of the new system.

Part IV assessed the generated reports.

The researcher determines the validity of the instrument using Good and Skates rated by twenty persons (20) including the IT Expert, Librarian, and the Grammarian. The result was four-point eleven (4.11) which shows that the questionnaire was valid.

The reliability of the instrument for specific objective three (3) using Test Re-test reliability. The reliability coefficient resulted in zero points eighty-nine (0.89) and was interpreted as reliable.

The benefits of the system for the librarian and staff of Cadiz City Public Library by responsible to keep all the books to manage the borrowed and returned. The benefit to be acquired lessen the time transaction, easy access and efficient to use.

Figure 1: Use Case Diagram

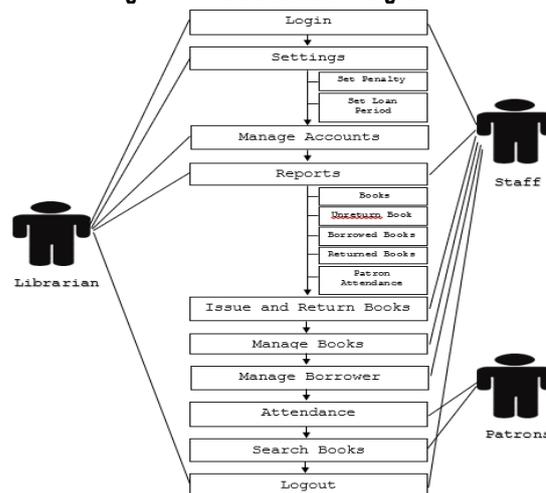


Figure 1 shows what would be the functions of the system and if it was accessible to every user of the system. It shows that the Librarian can log in, set settings of penalty and loan period of books, manage accounts, reports of books, borrowed, unreturned, returned books, attendance of patrons, and log-out. The staff can also log in to its account, report, issue, and return books, manage books, manage borrower, attendance, search books and log out its account. The patrons can log attendance and searching books available.

Results and Discussion

The researchers selected three (3) IT Experts to test the system. To determine the level of quality of the developed system, three (3) IT Experts rated the system based on McCall's Criteria for Software Quality Model.

Table 2: McCall's Criteria for Software Quality Model

Criteria	IT Experts			Mean
	1	2	3	
Auditability	4	4	4	4
Accuracy	4	4	3	3.67
Completeness	4	4	4	4
Communication Commonality	4	4	4	4
Conciseness	5	5	4	4.67
Consistency	5	5	4	4.67
Operability	4	5	4	4.33
Security	4	4	3	3.67
Self-Documentation	5	4	5	4.67
Software System Independence	4	4	4	4
Traceability	4	4	5	4.33
Training	4	4	4	4
Data Commonality	4	4	4	4
Error Tolerance	4	4	4	4
Execution Efficiency	4	5	4	4.33
Expandability	5	4	4	4.33
Generality	4	4	4	4
Hardware Independence	4	4	3	3.67
Instrumentation	4	3	4	3.67
Modularity	4	4	4	4
Grand Mean				4.10

Table 2 shows the results that the system has a Grand Mean of four-point ten (4.10) which is interpreted as Good based on the criteria set forth by McCall's Criteria for Software Quality. The result shows that the system was of good quality.

To determine the sample size of the respondents, the researcher used the Purposive Sampling Technique for the Staff and Librarian and Convenience Sampling Technique for the Patrons. Fifty-two (52) Respondents were selected. They were given a set of questions to rate the system

based on the Computer System Usability Questionnaire and researchers' Self-made questionnaire.

To determine the level of quality in the use of the developed system, the researcher used Computer System Usability Questionnaire (CSUQ) and was rated by the end-user.

Table 3: Level of Quality in Use of the Developed System based on CSUQ

	Mean	Interpretation
1. Overall, I am satisfied with how easy it is to use this system.	6.80	Agree
It was simple to use this system.	6.80	Agree
2. I can effectively complete my work using this system.	6.60	Agree
3. I am able to complete my work quickly using this system.	6.50	Agree
4. I am able to efficiently complete my work using this system.	6.40	Agree
5. I feel comfortable using this system.	6.60	Agree
6. It was easy to learn to use this system.	6.80	Agree
7. I believe I became productive quickly using this system.	6.60	Agree
8. The system gives error messages that clearly tell me how to fix problems.	6.20	Agree
10. Whenever I make a mistake using the system, I recover easily and quickly.	6.20	Agree
11. The information (such as online help, on-screen messages, and other documentation) provided with this system is clear.	6.30	Agree
12. It is easy to find the information I needed.	6.70	Agree
13. The information provided for the system is easy to understand.	6.70	Agree
14. The information is effective in helping me complete the tasks and scenarios.	6.40	Agree
15. The organization of information on the system screens is clear.	6.60	Agree
16. The interface of this system is pleasant.	6.40	Agree

17. I like using the interface of this system.	6.50	Agree
18. This system has all the functions and capabilities I expect it to have.	6.10	Agree
19. Overall, I am satisfied with this system.	6.60	Agree
Grand Mean	6.50	Agree

Table 3 shows the result in terms of determining the level of quality of the developed system, the system has a Grand Mean of Six Point Fifty (6.50) which is interpreted as Agree.

To determine the level of performance of the developed system, the researcher used Researcher's Self-made Questionnaire.

Table 4: Level of the Performance of the New System based on Researcher's' Self-made Questionnaire

In Terms of Determining the Level of Performance of the New System.	Mean	Interpretation
For Librarian		
1. The system can provide easy access to information about books.	5.00	Very Good
2. The system can generate reports of books being borrowed and returned.	5.00	Very Good
For Circulation Staff		
3. The system can easily provide information on the list of borrowers.	5.00	Very Good
4. The system is effective in monitoring the availability of books.	5.00	Very Good
5. The system is efficient in terms of borrowing and returning transactions.	5.00	Very Good
6. The system can generate reports of books being borrowed and returned.	5.00	Very Good
For Patrons		
7. The system is faster and convenient in generating reports related to the Patrons' attendance.	4.80	Very Good
8. The system is efficient in searching books.	4.80	Very Good
Grand Mean	4.95	Very Good
In terms of generating reports of Borrowed Books, Returned Books, Un-return Books, List of Books and Borrower, and	Mean	Interpretation

Attendance of Patrons		
For Librarian/Circulation Staff		
1. The system is efficient in generating reports.	5.00	Very Good
2. The reports generated by the system are reliable.	5.00	Very Good
3. The system can generate reports effectively.	5.00	Very Good
4. Accuracy in generating reports:		
List of Books	5.00	Very Good
List of Borrowers	5.00	Very Good
Borrowed Books	5.00	Very Good
Returned Books	5.00	Very Good
Un-returned Books	5.00	Very Good
Patrons Attendance	5.00	Very Good
5. The system can produce the desired content in generating reports.	5.00	Very Good
Grand Mean	5.00	Very Good

Table 4 shows the result in terms of determining the level of the Performance of the Developed System, the system has a Grand Mean of four Point Ninety-Five (4.95) which is interpreted as Very Good. It shows that the system has aided the Librarian and Staff in terms of the transaction inside the Library and the Patrons in terms of searching for books. In terms of generating reports, the system has a Grand Mean of Five (5). It shows that there was an ease in terms of generating of reports and interpreted as Very Good. The result shows that the system generated results effectively.

Conclusion and Recommendation

Based on the findings presented in this study, the researcher concludes the following:

- The system has passed the evaluation based on McCall's Criteria, thus considered as of good quality.
- The system has passed the evaluation by the End-user using the Computer System Usability Questionnaire.
- The system has upgraded the level of the performance of the system currently used by the library using the Researcher's Self-made Questionnaire.
- The system has the capabilities of efficiently generating reports needed by the Librarian.

Recommendations

Based on the findings and conclusions drawn, the following recommendations are:

1. In terms of software quality, the developed system was good, thus recommended for implementation.
2. In terms of the system's usability, the system was excellent, thus the researcher was recommended to conduct training for End-users.
3. In terms of the level of performance of the new system, the system was efficient thus recommended for utilization.
4. In terms of generating reports, the system was effective thus recommended for implementation.
5. The End-user recommended the researcher provide a layout for the ID of the patrons.
6. The system was also recommended to have online support for searching for books.
7. The researcher also recommended that a similar study may be conducted to assess further effectiveness and the usefulness of the developed system.

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