

## International Journal of Computer Science and Mobile Computing



A Monthly Journal of Computer Science and Information Technology

ISSN 2320-088X

IMPACT FACTOR: 7.056

*IJCSMC, Vol. 10, Issue. 4, April 2021, pg.63 – 66*

# BARANGAY CONSTITUENTS INFORMATION and SERVICES MANAGEMENT SYSTEM

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DOI: 10.47760/ijcsmc.2021.v10i04.009

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*Abstract— As the global environment ages, the emerging trend for Information Technology has risen above the development initiatives' surface. The Barangay currently used a manual process in issuing Barangay Certificates, Business Permit, Summon Letter, etc. This caused a lengthy procedure in accessing the records and files, which sometimes cause record redundancy. The study's objective was to design and develop a Barangay Constituents Information and Services Management System to improve record retrieval in the Barangay. Research methodology used in this study was developmental and descriptive research. Likewise, an Iterative systems development model was used in the design and development of BCISMS. It uses developmental research since this study involves creating a database system that could use for the Barangay. Descriptive analysis because IT Experts evaluated the BCISMS based on McCall's Software Quality Standards and Barangay Respondents on ISO/IEC 9126-1:2000 Quality. Interview approach was used in collecting information to know the manual process in the Barangay. The iterative Systems Development approach is used to come up with the proposed BCISMS. Respondents of the study were the Punong Barangay, Barangay Kagawad, and Barangay Secretary. Researcher conducted interviews on-site with the Punong Barangay, Barangay Kagawad, and Barangay Secretary. Evaluation instruments used were McCall's Software Evaluation Criteria for Software Quality Model and ISO/IEC 9126-1:2000. Software Quality Model Characteristics. The Barangay Constituents Information and Services Management System were Very High in the result. It shows that the system was capable of managing records of the barangay and reliable in handling data for further use.*

*Keywords— Information Technology, Constituents, Management System, Software Quality Model, Retrieval*

### OBJECTIVES OF THE STUDY

The general objective of the study was to develop and design a Barangay Constituents Information and Services Management System for the improvement of record retrieval in the barangay. Specifically, it aimed to achieve the following: 1.Design and develop a BCISMS for the following features: searching barangay records, managing health records, generating barangay reports, and graphical analysis of barangay census. 2. Evaluate the BCISMS in terms of functionality, reliability, usability, efficiency, maintainability, and portability.

### MATERIALS AND METHODS

The research methodology used in this study was developmental and descriptive research. Likewise, an Iterative systems development model was used to design and develop Barangay Constituents and Services

Management System's development. It uses developmental research since this study involves creating a database system used for the barangay. Descriptive research in the sense that IT Experts could evaluate the Barangay Management Information System based on McCall's Software Quality Standards and Barangay Respondents on ISO/IEC 9126-1:2000 Quality Characteristics. An interview approach in gathering data and information is used to know the barangay's manual system process. The Iterative Systems Development approach was used to come up with the proposed BCISMS. An iterative model's development stage includes system design, coding development, and tested in repeated cycles. This approach was a way to break down the extensive application into smaller chunks. It has been recognized that the user interface design should be done iteratively since it is impossible to design a user interface that has no usability problem from the start. Even experts in interface design cannot perfect the user interface in just a single attempt. In that matter, usability engineering was a lifecycle where should be built around the concept of iteration (Nielsen, 1993). Nielsen also emphasized that iterative development involves the steady refinement of design as a requisite in user testing.

### Respondents of the Study

The respondents of the study were the Punong Barangay, Barangay Kagawad, and Barangay Secretary. The researcher purposely selected the respondents. Table 1.0 on showed the number of respondents in the study.

TABLE 1. Summary of Respondents

<b>Respondents</b>	<b>Number of Respondents</b>
Barangay Zone 4A	9
Barangay Zone 5	9
Barangay Efigenio Lizares	9
Barangay Bubog	9
Barangay Dos Hermanas	9
IT Experts	5
<b>Total Respondents</b>	<b>50</b>

### Research Instrument

To achieve the objectives of this study, the researcher adopted the following instruments to collect data. The researcher conducted interviews on-site primarily with the Punong Barangay, Barangay Kagawad, Barangay Secretary, and Barangay Health Worker. The evaluation instruments used in the study were McCall's Software Evaluation Criteria for Software Quality Model and ISO/IEC 9126-1:2000 Software Quality Model Characteristics. McCall's Software Quality Model had twenty-four criteria. The ISO/IEC 9126-1:2000 was an International Organizations for Standardization/ International Electro-technical Commission criteria-based assessment that consists of six characteristics and twenty-six sub-characteristics in the evaluation of the software. Thus, I used a five-point scale where 5 as the highest and 1 as the lowest.

### Mean Score Verbal Interpretation

4.21-5.00 Very High

3.41-4.20 High

2.61-3.40 Moderate

1.81-2.60 Low

1.00-1.80 Very Low

### Data Gathering Procedures

A request letter to conduct an interview and evaluation of the software was sent to the Punong Barangay. Further, standard instruments were adopted in the evaluation of the software. The researcher personally distributed the instrument to the respondents after the demonstration of the system software. Then it was retrieved after the evaluation.

### Data Analysis Procedures

To determine the result of the software evaluation, evaluation ratings were encoded using a Spreadsheet program. Mean was used in computing and measuring the acceptability of the software.

### Software Life Cycle Model

The researcher used an Iterative Software Development Model. The Iterative starts with the small chunk of the system requirements and iteratively enhances until the entire system was implemented. During each iteration design modifications were made, and added functional capabilities. The basic idea behind this method was to develop a system through repeated cycles (iterative) and in smaller portions at a time (incremental).

### Software Development Phases

The phases of software development using the Iterative Model were; requirements analysis, system design, system coding, system testing, and system implementation.

### RESULTS AND DISCUSSION

Table 2.0 used the McCall's Software Evaluation Criteria for Software Quality Model. It shows that the generality of the system program components was rated Very High. Furthermore, the consistency of the system's design techniques, the ease of its operations, its data security, its controllability of the program structure, the decomposability of every part of the program, as well its error tolerance, and the simplicity of use resulted into Very High. Generally, the evaluation of the BCISMS was Very High. It shows that the system was capable of managing records of the barangay and reliable in handling data for further use. The IT experts concluded that the system was feasible to use and can manage barangay transactions based on the evaluation criteria.

TABLE 2. Evaluation of IT experts on the Barangay Constituents Information and Services Management System

Criteria	Mean	Verbal Interpretation
Auditability	4.400	Very High
Accuracy	4.400	Very High
Completeness	4.400	Very High
Communication Commonality	4.600	Very High
Conciseness	4.400	Very High
Consistency	4.800	Very High
Observability	4.600	Very High
Operability	4.800	Very High
Security	4.800	Very High
Self-Documentation	4.600	Very High
Simplicity	4.800	Very High
Software System Independence	4.400	Very High
Traceability	4.400	Very High
Training	4.400	Very High
Controllability	4.800	Very High
Data Commonality	4.400	Very High
Decomposability	4.800	Very High
Error Tolerance	4.800	Very High
Execution Efficiency	4.600	Very High
Expandability	4.600	Very High
Generality	5.000	Very High
Hardware Independence	4.800	Very High
Instrumentation	4.600	Very High
Modularity	4.600	Very High
Overall	4.617	Very High

Table 3.0 shows the result of evaluating the respondents of the five selected Barangays in Talisay City, Negros Occidental using the ISO/IEC 9126-1:2000 Software Quality Model Characteristics. The system functionality

was rated as very high. This was because the system was suitable for providing appropriate functions to the barangay's needs, as seen by the study respondents. Further, the system offers practical accuracy on the agreed results in functionalities and the capability to secure the data from unauthorized access to information. As a whole, the result was very high and revealed that the system was reliable, usable, efficient, maintainable, and portable to be used.

TABLE 3. Evaluation of Development of Barangay Constituents Information and Service Management System

Areas	Mean	Verbal Interpretation
Functionality	4.609	Very High
Reliability	4.450	Very High
Usability	4.489	Very High
Efficiency	4.570	Very High
Maintainability	4.236	Very High
Portability	4.382	Very High
Overall	4.456	Very High

### CONCLUSION AND RECOMMENDATION

Based on the interpretation that discussed, the following conclusions were derived: The IT experts rated the developed software as Very High, using the McCall's Software Quality Model, for they had seen the features of the software that were capable of handling and securely managing the barangay records, the information was readily available for barangay, and the software contributed to the efficiency of services to the barangay residents. The software was easy to use and reliable in handling barangay records as it revealed the importance of the system usability and efficiency to speed up transactions in the barangay. The software was capable of maintaining and be installed for Barangay's use and advantage. Based on the findings and conclusions derived from the study, the following recommendations were: To the Barangay Zone 4-A, the may consider the development system to improve operational efficiency and help hasten the transactions and services to the barangay residents. The other neighboring barangays may opt to adopt the developed software to enhance transactions and services offered to their respective barangay. Thus, it can conduct training to assist the end-user in using the system correctly and efficiently. The barangay may continue to update the design information, maximizing its potential and improving its functionalities, security, and efficiency.

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