



Research Article

## BARANGAY OFFICE MANAGEMENT SYSTEM

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### ABSTRACT

A Barangay is considered as the smallest unit of the government in the Philippines. It performs the initial operations such as formation and employing of programs, activities, policies and other that involved the community. As the Philippines, population increases, the number of households in each barangay in the country increases. As a result, more and more people are seeking the service of the barangay council as the unit of local government close to people. An increasing number of people mean increasing works for the barangay council members and staff.

Today, population continually upgrades those results into a growing number of labor especially the Barangay Secretary, Barangay Treasurer, and Barangay Clerk. Summarizing the procedures in different barangay such as Barangay Tikay, Barangay Dakila, and Barangay Mojon in Malolos City, and Barangay Sta. Monica in Hagonoy, Barangay Panducot in Calumpit and Barangay Malhacan in Meycauayan requiring immediate response to this scenario a possible solution is an efficient and effective Management Information System. The development of a Barangay Office Management System enables the user to manage and print barangay citizen's request and financial records and reports such as: Payroll for honoraria and allowance, Disbursement voucher, Account's Advice, Purchase orders, Purchase Receipt, Reimbursement Expense Receipt, Inspection Report, Acceptance Report, Liquidation Report, Accomplishment Report, Requisition and Issue Slip, Summary of Cash Payments, Summary of Checks Issued, Summary of Paid Petty Cash Vouchers, Summary of Collections, Budget Information, Census, Barangay Cases, Barangay Certificates, Barangay Clearance, Barangay Indigency, Barangay Bonifide, Barangay Recommendation, Barangay Permits, Occupancy Permit, Building Permit, Business Permit, Billboard/Tarpaulin Permit and Excavation Permit. Regarding the development tools needed the researchers utilized PyDev Eclipse Version 2.2.4 for the Programming Language and MS SQL 2008 for the database.

**KEYWORDS:** Barangay, Local Government, Office Management, Secretary, Treasurer

### INTRODUCTION

Today, as IT has become less of choice but more of a requirement for individuals and computers play a crucial role in assisting people in organizing, storing and retrieval of a huge amount of information, and making them readily and instantly available. IT as a tool enables us to do more tasks, thus making it a vital commodity especially in working environments such as a Barangay. The municipality of Malolos is composed of different urban Barangay which is considered as the smallest unit of government in the Philippines. It performs the initial

operations such as formation and employing of programs, activities, policies and other that involve the community. As the Philippine population increases, the number of households in each Barangay in the country increases. As a result, more and more people are seeking the service of the Barangay council as the unit of local government close to people. An increasing number of persons mean increasing works for the Barangay Council members and staff.

### Description of Barangay Office Management System

The system focuses on creating a Barangay Office Management System facilitated by the Barangay Secretary,



Barangay Treasurer, Barangay Record Keeper, and Barangay Clerk depending upon the transaction they are involved. Barangay Census is the procedure of systematically acquiring and recording information about the members of a given population. The secretary is the administrator who can manage all the records while the Barangay Clerk and Barangay Record Keeper can only view the stored information. The receipt serves as a financial and clearances. Barangay Clearance is a certification from a Barangay Captain stating that person is a bonafide resident of the said barangay while Business Clearance is a legal document that offers proof of compliance with a definite city or state laws regulating structural appearance and safety as well as the sale of products. Another is Indigence Certification which is an official document declaring that the requesting person belongs to underprivileged families in the barangay. The Secretary, Barangay Record Keeper, and Clerk can perform command such as add, edit and save information. It should have control number in every form. Barangay Case Records is a written account of those people who have violated the barangay laws. The Secretary can access all the transaction while Barangay Record Keeper and Barangay Clerk can only view and search the details.

Figure 1: Main Menu



Figure 2: Treasurer Menu



Figure 3: Secretary Menu



The Treasurer Menu Form as shown in Figure 2 displays the entire sub menu for the treasurer. It includes all the transactions performed by the treasurer such as Payroll, Disbursement Voucher, Account's Advice, Purchase Orders, Purchase Receipt, Reimbursement Expense Receipt, Inspection Report, Acceptance Report, Liquidation Report, Accomplishment Report, Requisition and Issue Slip, Summary of Cash Payment, Summary of Checks Issued, Summary of Paid Petty Cash Vouchers, Summary of Collections and Budget Information.

As shown in Figure 3 the Secretary Menu Form shows all the transaction of the Secretary such as Barangay Census, Barangay Clearance, Indigency Certification, Residence Certificate, Barangay Recommendation, Barangay Permit, Business Permit, Billboard/Tarpaulin Permit and Excavation Permit.

The Barangay Office Management System is capable of running a computer with Windows XP and higher operating system. It was developed using PyDev programming language, SQLite3 as its database and Adobe Acrobat Reader 9.0 for its reports. The hardware requirements specification for the processors is 88 MHz or 2.6 GHz. The minimum requirements for memory are at least 512 MB or greater while the recommended requirement is at least 2 GB. The hard drive category, requirement specification must be at least 750 MB, while the recommended hard drive space is at least 1 GB or higher. For the operating system the requirements are Microsoft Windows XP, Professional SP3, Vista SP1, and Windows 7 Professional.

**RELATED WORK**

Electronic government (e-government) was often heralded as the new way forward for the public sector in both developed and developing countries. There are several examples of how this form of government leads to increased rated of development and allows for greater democracy, and how it was successfully implemented in developing countries. [1] (Krishna, Walsan 2005, Bhatnagar 2002).

E-Government remains a knowledge field in its exploratory stages and is consequently, difficult to accurately define. Furthermore, it encompasses such a broad spectrum that is hard to find one expression that specifies what e-

Government represents. However, the term is loosely used to describe the legacy of information and communication technology within the public sector and shows the use of Internet to deliver information and services to the government. [2] Bhatnagar (2004).

According to the [3] World Bank website (2005), e-government was defined as: “information technologies that have the ability to transform relations with citizens, businesses, and other arms of government...[and] can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.”[4]

Ciborra (2005) uses a framework when describing the use of e-government in developing countries; where the focus of technology is the ordering of the relationship between the administration and the citizen, in setting the boundaries between the state and the market, and in ensuring of greater accountability and transparency. He said that this is often the reason for developing countries to partake in e-government projects, as having such a system is believed to equate to models of ‘good governance’ and increased development, and hence affects the levels of aid that they receive from wealthy nations.[5]

Jaeger and Thompson (2003) assert that an e-government system would fail if the government did not take an active role in educating citizens about the value of e-government. Although speaking from the context of a developed country, one can envisage how this situation was aggravated in developing countries where more often than not, literacy rates are low and educational institutions are lacking. [6]

Odedra-Straub (2003) states that developing countries have severe limitations regarding connectivity, and the underlying presence of user access required to partake in processes of a market society. Thus we can infer that e-government would probably fail if the users did not have the ability to use the technology to enable access to useful information and services. This lead to a little user base, as the system would not be equally accessible to all citizens.

The Philippines, an archipelago of 7,100 islands in Southeast Asia, faces new opportunities as it competes with the rest of the world in the information and communication technology (ICT) arena. New industries including call centers, external medical transcription services, and the hugely popular multiplayer online gaming systems require the rolling-out of a much needed ICT architectural backbone and support systems and a readily available pool of ICT-trained workers.

The LGC mandates that internal control of LGUs be a responsibility of the local accountant. However, only financial or accounting control is being performed by them. The other important aspects of the task, such as administrative, program and management controls are not completed by the office. In 2003, then President Gloria Macapagal-Arroyo issued AO No. 70 directing LGUs “to organize an Internal Audit Service in their respective

offices.” This was related to the earlier AO No. 278 in 1992 of Pres. Corazon Aquino, which directs the strengthening of Internal Control Systems in all government offices, including the LGUs. The primary goals of an internal control audit are to establish the areas of vulnerability to corruption and plan control mechanisms to address those weaknesses. Internal control assessment looks into the effectiveness and sufficiency of controls, tests the controls and recommends solutions for the identified weaknesses and inefficiencies of such controls. The primary responsibility of ensuring existing internal control is on the Local Chief Executive. This was one aspect that has been lacking in many LGUs of the country.

In broad strokes this article adumbrates some issues in Filipino virtual communities and social interactions mediated by information technology (IT). Problems and prospects are explored with the optic of the barangay, a social unit that evolved from the pre-Spanish ‘boat community to its present dominant geo-political form. While IT tends to be instrumental in Western hegemonic encroachment into the Filipino lifeworld, some of its libertarian potentials are gaining ground in emerging *cyber-barangays* which require new ‘focal things and practices.’ The emerging Filipino communities mediated by IT are spheres of localization amid globalization and questions of nationhood. The article also proposes to ‘Filipinize’ IT - that is, to creatively and critically appropriate IT into practices congenial to Filipino culture. [7] The Information Site on Philippine Politics and Government (2003).

On the word of [8] Francesca Tassarollo (2010), a good information system is significant for the proper functioning of every organization. Nowadays, organizations have to manage many data and pieces of information and have to meet the needs of the market in an increasingly precise and fast way. To do all this in the best possible way, companies need an efficient information system. To organize and manage the data and information the organization must have a good information system. The data and information must be accessible timely, and every time the users need it. In this way, the users or employees in the organization can have access to the information needed in real time and can make a decision in a fast way.

Along with an increasing need for the organizations to have automated and computerized information systems, also the offer of products conceived for this purpose increases. Many organizations specialized in the production of software instruments offer more useful products, which can meet the needs of all types of organization, try to keep pace with the constant developments and changes in the market. With these instruments succeed in optimizing time and in working in a more precise and faster way.

As stated by [9] Eithne Rhoads (2011), information system has a variety of offers that would benefit every association. There are many things to understand within the organization and it was understood with the use of IT information, procedures, peoples, and documents.

Organizations and users should be aware of many things that can information system can offer. The information system has different jobs that can be completed for the organization.



RESEARCH METHODOLOGY

This part of the research deals with the methods used by the researcher in developing the system. In this section, the researchers deal with the different methods, techniques and systematic approaches that he utilized in the analysis and the design of the representation. This involved the System Development Life Cycle (SDLC) which is a conceptual model used in project management that describes the stages involved in an information system development project, from an initial feasibility study through maintenance of the completed application.

Software Engineering presented the waterfall models one of the oldest models and is widely used in government projects and many major companies. This model emphasizes planning in early stages, it ensures design flaws before they developed. Also, its intensive document and preparation make it work well for projects in which quality control is a major concern. The pure waterfall lifecycle consists of several non-overlapping stages, as shown in the following figure. The model begins with establishing system requirements and software requirements and continues with architectural design, detailed design, coding, testing, and maintenance. The waterfall model serves as a baseline for many other life cycle models. The quality of the product by reviewing each change made in the maintenance stage. Consider applying the full waterfall development cycle model when correcting problems or implementing these enhancement requests.

In each stage, documents that explain the objectives and describe the requirements for that phase was created. At the end of each stage, a review to determine whether the project can proceed to the next stage was held. Prototyping can also be incorporated into any stage from the architectural design and after. (Mohammed et.al, 2010)

Planning Phase. The planning phase is the most critical step in completing software development. In planning, the problem in the existing system is identified to understand the operation of the present. The objectives are one again considered in planning to develop a system that will enhance the present system.

**Analysis Phase:** In the analysis phase, the researcher analyzes the difference between the present system and the developed system. The problem in the current system was studied to compare the existing system and the developed system. This was made part of the investigation of the inputs and outputs.

**Design Phase:** In this stage the information gathered in the previous stage allows the researcher to write about the elements of the new and improved system. The input and output record during the design was prepared, forms are laid out, and file specifications was written. Major aspect of design phase includes structuring the kind of interface used for the software.

**Development Phase:** The developed system was built based on the designs conceived an earlier phase and through the use of the developed programming language which is Visual Basic .NET and the used of SQL Server which serves as database management system.

**Testing Phase:** This phase covers the process of testing the efficiency, accuracy, reliability, speed and security of the developed software. After the facilities has been installed, programs, software, and hardware will be tested to ensure design specifications was met.

**Implementation Phase:** The system was implemented with minimum requirements. It fully utilizes by the user. All users was trained on how to use and implement the system.

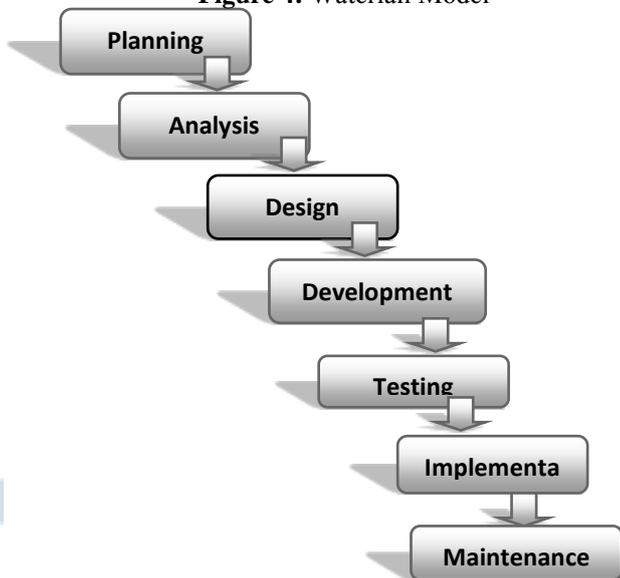
**Maintenance Phase:** In this stage the last phase of the cycle that deals with the changeover to a new improved system. Final changes and modifications was incorporated in the new system at this stage.

RESULTS AND DISCUSSION

The fundamental concern of the study entitled Barangay Office Management System is to determine its acceptability. The rating from the respondents was treated statistically using a Likert Scale and was recorded based on the weighted mean or average, presents, analyzes, and interprets the data gathered in the study based on the response to the Software Quality Evaluation Criteria such as: Functionality, Reliability, Usability, Maintainability, Portability and Training and Documentation.

Expert's rated the developed system regarding functionality as "Excellent". Suitability gathered a weighted mean of (4.5) which indicates that functions are appropriate to specifications. The respondent rated accurateness as "excellent" with a mean performance of (4.25) which means that Functions are correct. Concerning Interoperability, Software can interact with other components or systems the respondents was evaluated as "Very Good" with a mean performance of (4.25). The compliance indicator that defines adherence to standards recorded a mean value of (4.75). The Security Indicator that measures provision for security requirements the respondent's mark as "Excellent" with a mean value of (4.25). Overall, the proposed system recorded a mean value of (4.26) which means that the proposed system is excellent regarding Functionality.

Figure 4: Waterfall Model



Regarding Reliability a descriptive rating of “Very Good” was interpreted for the Barangay Office Management System: Absence of failures of the system gathered a weighted mean of (4.25) with a descriptive rating of “Excellent”, and Fault Tolerance was evaluated with a weighted mean of (4.25) and was interpreted as “Very Good.” Regarding the ability to produce correct computations, output or reports the respondents gave an “Excellent” remarks with a mean performance of (4.65). The researcher concluded that the system has the capability to withstand client breakdown and hold single running application.

IT experts rated the Usability of the Barangay Office Management System as “Very Good.” Among the four items presented (1) *Ease of use which the systems functions can be understood* got the highest mean rating of 4.5 with a descriptive rating of “Very Good” as perceived by the system evaluators. The Learnability criterion, Operability, and Provision for comfort and convenience got a mean rating of (4.25). It was agreed that the system is visually appealing and at the same time easy to learn.

The Maintainability of the Barangay Office Management System received a descriptive rating “Excellent”: the ability to identify the cause of a failure within the software got a weighted mean of (4.25) with a descriptive rating of “Very Good.” The software adjusts well to different screen dimensions, color depths, and font sizes and got a weighted mean of (4.25) with a descriptive rating of “Very Good.” The sensitivity to change of a given system was rated (4.25) with a descriptive rating of Very Good. The researcher concluded that the system exhibits robust maintainability measures and presented a user-friendly interface of the developed system.

IT experts rated Training and Documentation of the Barangay Office Management System as “Excellent.”: every data inserted is correct was rated (5.00) Excellent; Documentation content was organized in a logical manner and the provision for help component got a weighted mean (5.00) were excellent. The researcher concluded that the systems provides guides and printed documentation and all information is readily accessible for reference.

The data revealed that the system was rated “Excellent” regarding Functionality (4.6); Reliability (4.37); Usability (4.43); Maintainability (4.66); Portability (4.6); and Training and Documentation (5.00). Comparatively lower ratings was given to the system regarding Functionality and Portability (4.6). As a whole, the obtained mean value of 4.61 indicates the proposed system was “Excellent,” and was recommended for use in any Barangay.

## CONCLUSION

The following are based on the findings of the study:

- i. The Barangay can greatly benefit by using the developed Barangay Office Management System that was specifically configured for the office transactions of a Barangay.
- ii. The Barangay Office Management System has the following significant features: Functionality; Reliability; Usability; Maintainability; Portability, and Training and Documentation.

- iii. The Waterfall model was effectively used in developing the Barangay Office Management System.
- iv. The Barangay Office Management System used PyDev programming language, SQLite3 as its database and Adobe Acrobat Reader 9.0 for its reports.
- v. The Barangay Office Management System is functional in terms of Functionality; Reliability; Usability; Maintainability; Portability, and Training and Documentation.

## REFERENCES

- [1]. Krishna, S. and Walsham, G. (2005) Implementing Public Information Systems in Developing Countries: Learning From a Success Story, *Information Technology for Development*, 11, 2, 123-140.
- [2]. Bhatnagar, S. (2004) Bhatnagar, S. (2002) E-government: Lessons from Implementation in Developing Countries, *Regional Development Dialogue*, 24, UNCRD, Autumn Issue, 164-174.
- [3]. World Bank Website (2005) Definition of E-Government: <http://www1.worldbank.org/publicsector/e-gov/definition.htm>
- [4]. Ciborra, C. (2005) Interpreting e-Government and Development Efficiency, Transparency or Governance at a Distance *Information Technology & People*, 18, 3, 260-279.
- [5]. Jaeger, P.T. and Thompson, K.M. (2003) E-Government Around theWorld: Lessons, Challenges, and Future Directions, *Government Information Quarterly*, 20, 4, 389–394.
- [6]. Odedra-Straub, M. (2003) E-Commerce and Development: Whose Development the Electronic *Journal of Information Systems in Developing Countries*, 11, 2, 1-5.
- [7]. The Information Site on Philippine Politics and Government (2003).Barangays. Available: <http://www.i-site.ph/Factfinder/barangay.html>. (September 20, 2011).
- [8]. Tessarollo, F. (2010).Information system, the backbone of every company. Available: <http://goarticles.com/article/Information-system-the-backbone-of-every-company/3258457/>. (September 20, 2011).
- [9]. Rhoads, E. (2011). Methods information system management maintains a well working business system. Available: <http://goarticles.com/article/Methods-Information-System-Management-Maintains-A-Well-Working-Business-System/4642610/>. (September 20, 2011).

