



ICT-Based Budget Monitoring System for Local Government Units

Rosemarie M. Bautista

College of Information and Communications Technology,
Bulacan State University, Philippines

Abstract - *The Local Government Code of 1991 enables each local government unit (LGU) all over the Philippines to be self-supporting and becomes catalyst of development in the communities it serves. LGU's proper budget management, therefore, is vital in translating its vision and mission into reality. However, some budget-management related problems such as planning, tracking and monitoring need to be addressed in order to provide better services to the community. Modern technology may be used in the proper monitoring of budget expenditures. This research aims to determine the country's level of readiness to go online and to suggest an alternative way to monitoring of budget allocation of LGU through development of ICT-based system. The system was designed to allow authorized users to monitor accountabilities and expenses that may be incurred by each LGU's department. The study determined the significant features, and the most appropriate method of system development used in the development of an effective and reliable ICT-based budget monitoring system. The output of the study was evaluated by the employees of selected LGUs, IT specialists and IT instructors.*

Keywords - *ICT based budget monitoring, budget monitoring, local government unit, budget expenditure, municipality budget, city budget*

I. INTRODUCTION

The Philippines is composed of a little less than one thousand seven hundred Local Government Units (LGUs) classified as province and city, municipality distributed all over the country. Through the Local Government Code of 1991, each LGU is empowered to manage its own resources [1]. However, in a country where there is scarcity of monetary resources and budgets are limited, proper planning and monitoring of what the government already has is of paramount importance.

Early attempts in governance can be traced almost half a century ago when local government used the old government accounting system (OGAS) which was done manually [2]. Problems with the manual set-up are the delay of report generation and inconsistent, unreliable file recording. Since majority of the LGUs still operates manually several barriers such as difficulty in planning, tracking and monitoring of budget as well as creating financial-related decision hinder LGUs financial success.

As the Philippine government struggles to offer better services to the public and improve management, overseeing government funds proves vital. The advancement in ICT as well as the earnest desire to improve resources supervision moves the government to start investing in local government units' computerization. This vision of LGU computerization started to come into reality in June 1971 when the National Computer Centre (NCC) was established [3] which caters essential ICT trainings and system conceptualization for public sector [4].

Information technology has become a vital and integral part of every one's life. The fast pace in technology advancement brought wide opportunity to improve processes through hastening the creation of budget appropriation and allocation. It also opens opportunities in the proper monitoring of budget expenditures through development of a system. With technological breakthrough and advancement in ICT, processes can be improved and government transactions could be done in relatively shorter time with greater transparency.

This research explored ways to provide different approach to budget monitoring through web. The study aimed to integrate significant features of budget management in the development of the system and identify the development model to be used in developing a reliable ICT based budget monitoring system. The acceptability of the system in terms of accuracy, usability, user-friendliness and security was also determined. It also aimed to find out the level of readiness of the government to go online.

II. SIGNIFICANCE OF THE STUDY

The design and development of ICT-based budget monitoring system for local government units could help enhance the management of LGU's financial assets. With the system, the creation of effective, up-to-date budget plans as well as the ease of budget expenditure administration will be possible. Thus, the opportunities of budget expenditures proper monitoring will be opened.

The result of the study will be useful for the following:

General Public. Through the system, budget allocation for every department of the local government unit will be well-defined and properly allocated thus could improve government transactions’ transparency.

LGU Management. The developed system will be of help in establishing management’s decision regarding budget preparation and control for a more effective use of the LGUs resources.

Budget Office Staff. The system will be an aid in faster and more accurate handling of voluminous budget-related transactions that could be of great help in saving employee’s processing time. It could also ensure up-to-date delivery of different budget reports.

III. CONCEPTUAL FRAMEWORK

This framework guides the researcher in conducting an organized process of data collection and analysis that will result into gaining a more valuable conclusion as well as the development of an efficient and effective information system. The framework consists of input, process and output frames forming the basis of the overall structure of the developed system.

Keeping abreast with technology changes, problems are thoroughly analyzed and scrutinized in order to propose possible solutions to the existing problems. The input frame considers all relevant inputs and requirements in the development of the system. This includes the knowledge, operation, technical and infrastructure requirements.

The second frame, the process considers the activities required in transforming the inputs into desired output. This frame follows a methodology in system development. This includes: planning, analysis, development of system design; programming; and system debugging, testing and evaluation.

The study came up with a prototype of the system which was analyzed and tested. The last frame, therefore, shows the expected outputs, both short term and long term, as well as the impact of the study. The immediate output of the study is the development ICT-based budget monitoring system which may lead to a long-term output – the enhancement of local government units’ budget management. The expected impact of the study is a well-defined and properly accounted LGU department budget.

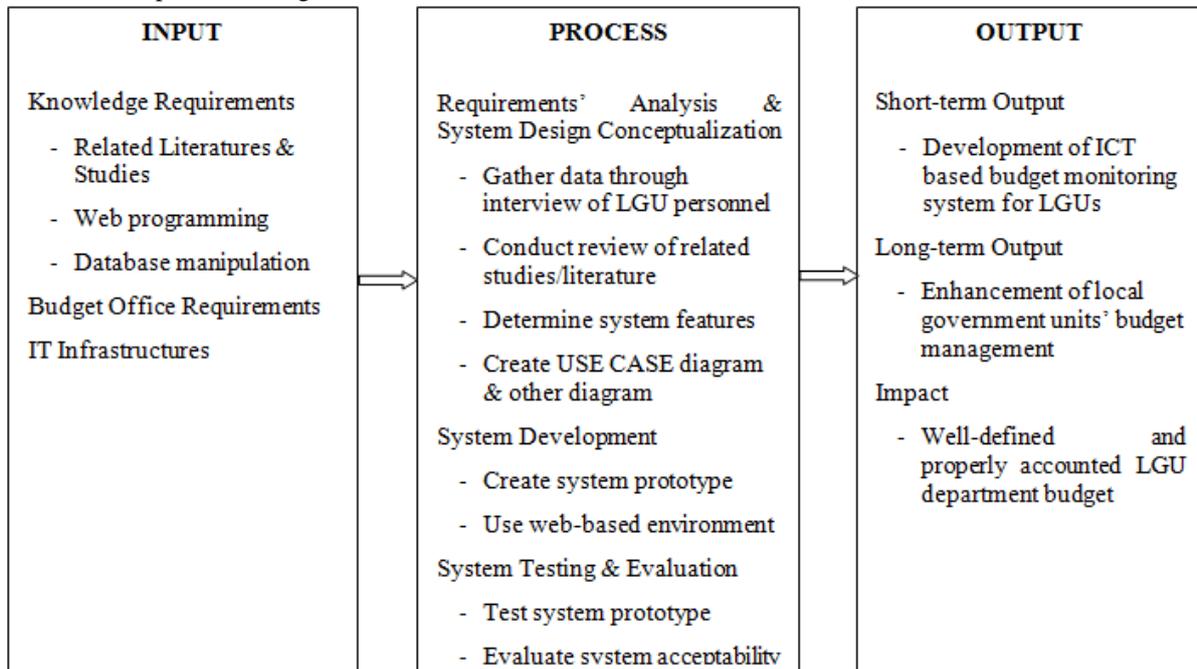


Fig. 1. Conceptual framework

IV. SYSTEM DEVELOPMENT METHODOLOGY

This study uses the Unified Modelling Language (UML) particularly USE CASE and Sequence diagrams in specifying, constructing and communicating the components and design of the proposed system.

Figure 2 shows the functionality of the ICT-based Budget Monitoring System for LGUs in the Philippines. The system administrator is the IT personnel who will be in charge of maintaining the system and will be given full authority and responsibility over the information stored in the system. He will also be allowed to add and modify department new to the LGU. Another important in the diagram is the individual LGU department representative who is in charge of submitting proposed or projected budget requirement as well as the obligation request forms of the department the actor is assigned. The department may also receive reports pertinent only to the tasks or functions it is performing. The budget officer who is in charge of managing the approval, release and flow of the LGU budget also play part of the system. He is responsible in adding and modifying the budgets submitted to the office. The accounting officer, on the other hand, approves the obligation requests submitted by individual department.

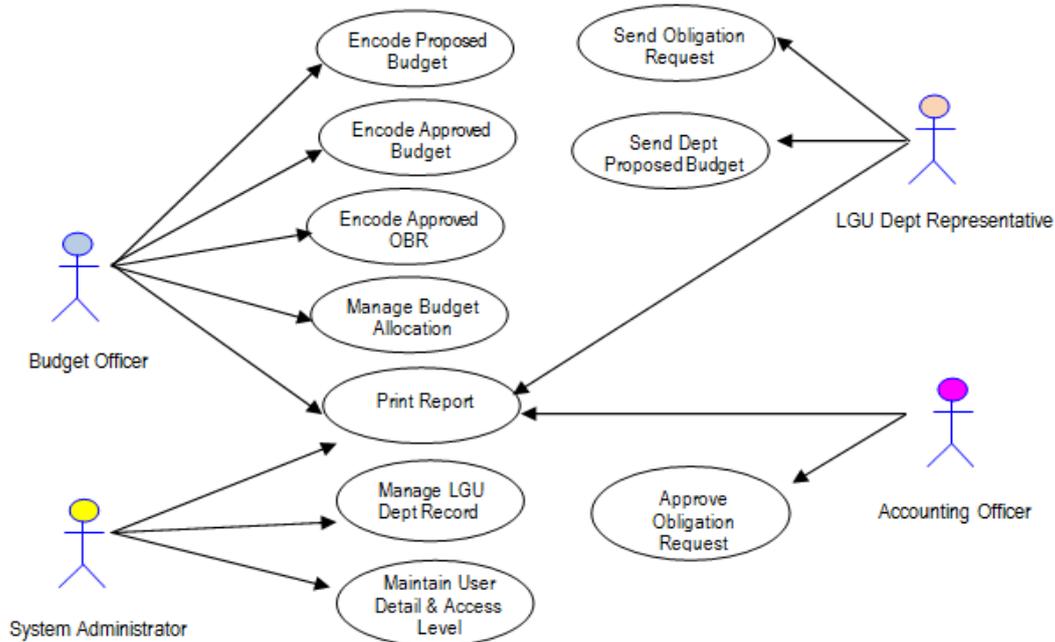


Fig. 2. USE CASE diagram for the system

Sequence diagram as shown as in Figure 3 shows the interaction between the objects involved in the system over the progression of time. The objects in the ICT-based Budget Monitoring System are: system administrator, LGU department, budget office and accounting office. The administrator manages the information about the different LGU department as well as the user of the system. Each department of the local government unit submits individual department budget for budget office copy. This will be submitted to the steering committee for approval. Approved budget will then be encoded by authorized budget officer. The expenditures of the department will then be based on the approved budget. To utilize the budget obligation request (OBR) should be submitted again for approval. The approved OBR can be accessed by the accounting department for the release of the budget. All reports can be accessed by only the department who owns the documents.

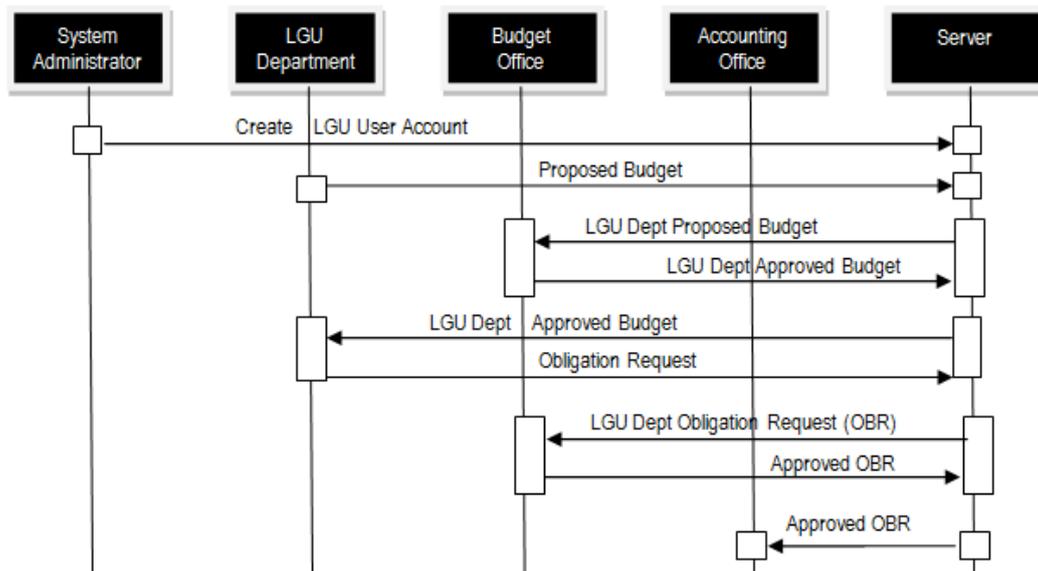


Fig. 3. Sequence diagram for the system

V. EVALUATION AND INTERPRETATION

To determine the respondent’s perception on the developed system, data gathered from the evaluation were examined and summarized. Responses were tabulated and interpreted using the mean value and the quantitative average of responses of the criterion in the evaluation sheet was determined. The acceptability of the system based on the respondents’ rating was quantified.

The system prototype was evaluated by three groups of respondents to determine the acceptability of the developed system. The respondents are selected employees of LGU, programmers and IT Instructors.

Table 1 shows the table of the respondents’ profile, their frequency of participation and percentage in the whole group.

TABLE I. PROFILE OF THE RESPONDENTS

Respondents	Frequency	Percentage
LGU Employees	10	20 %
Programmers	5	13 %
Information Technology Instructors	10	67%

In obtaining the mean value of scores, certain weighted score was assigned to the frequency of each category of responses according to these numerical values. The five-point Likert scale was utilized in getting the perceptions of the respondents according to the terms mentioned. The numerical scale and descriptive interpretation of the responses is provided in table 2.

TABLE II. SCALE USED IN GETTING THE PERCEPTIONS OF THE RESPONDENTS

Rating	Interpretation
4.51 – 5.0	Excellent
3.51 – 4.50	Very Good
2.51 – 3.50	Good
1.51 – 2.50	Fair
1.0 – 1.50	Poor

TABLE III. EVALUATION OUTPUT FROM THE RESPONDENTS

Criteria	Average Weighted Mean	Interpretation
Accuracy	4.24	Very Good
Usability	4.12	Very Good
User-friendliness	4.38	Very Good
Security	4.28	Very Good
Total Weighted Mean	4.24	Very Good

The table above shows the tabular representation of the evaluation output from the respondents. The criterion accuracy, usability, user-friendliness and security interpreted as very good. The over-all weighted mean of 4.24 shows that the system attained its objectives and is fully accepted by the respondents.

VI. RESULTS AND DISCUSSIONS

Among the LGUs, cities have the most number of computer units, with an average of seventy five units. The provinces come next with an average of sixty units and last are the municipalities with ten units [5].

In 1997, all government agencies and local government units were directed through Administrative Order No. 332 to have internet connectivity [6]. In June 2000, the Electronic Commerce Act of 2000 (RA 8792) was established to promote the use electronic mode in all government dealings and transactions [7]. In line with this, NCC undertook the e-LGU project in 2002 [8]. However, the LGU e-governance readiness survey conducted by the National Computer Center and the Research Development and Evaluation Center (RDEC) of the Western Mindanao State University last 2006, revealed that sixty percent of the eight hundred forty five surveyed LGU has already internet connection while forty percent showed no connection yet [9]. On 2015, Department of Science and Technology (DOST)'s Information and Communications Technology Office (ICTO) will implement a project that will give six hundred local government unit offices free Internet connection [10].

Aside from the basic application systems installed and used in LGU: Real Property Tax System (RPTS), Business Property Licensing System (BPLS), Treasury Office Management System (TOMS), Geographic Information Systems (GIS), Office Automation System (OAS), there are still some common software deployed in LGU. Top in the list is the Civil Registry Information Systems with seventy seven LGU users followed by National Government Accounting System (NGAS) which is used in forty eight LGUs, then by Payroll Processing System installed in twenty six LGUs.

Various reasons were accounted for the very small numbers of application systems installed and used considering that majority of the LGUs have already computer units. Among the top reasons provided by the respondents are: budgetary constraints, no qualified IT expert to handle the application system and lack interest or being least in the priority of the administration.

In analyzing and developing the proposed system a systematic approach called System Development Life Cycle (SDLC) was used. SDLC phases include system planning, analysis, design, programming and maintenance though the study covers only until testing and evaluation. To show the functionality of the system USE CASE diagram was used. Similarly, the sequence diagram was utilized to show the interaction between the objects or actors over the progression of time. The system was developed using Microsoft Visual Studio 2010 with MS SQL Server 2008 as its backend. It was proven to be acceptable in terms of usability, security, accuracy and user-friendliness. The over-all weighted mean of 4.24 shows that the developed system is acceptable to the respondents.

Figures 4 to 7 shows some of the significant features of the ICT-based Budget Monitoring System for LGUs. The system ensures the security through the security access code used by the all the users of the system. Only after supplying the valid username and password, a particular user will be allowed to have access to the system. Every user is given different level of access which is dependent on the tasks assigned to a particular user. The system also provides ways on how to manage special budgets and generate different reports.

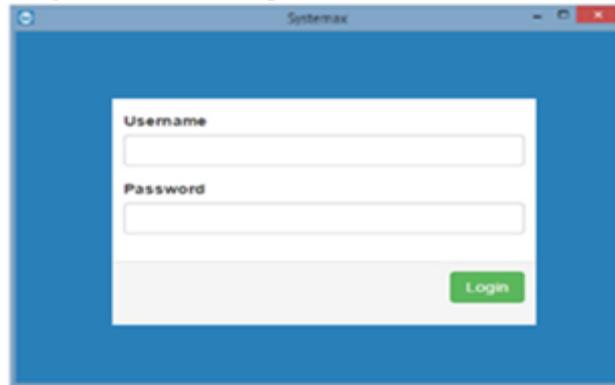


Fig. 4. Log-in window

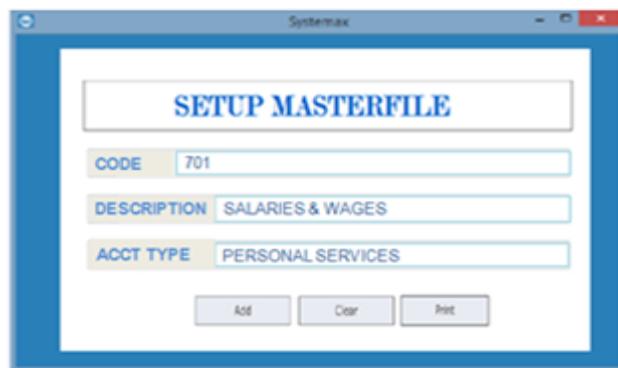


Fig. 5. Create new account window

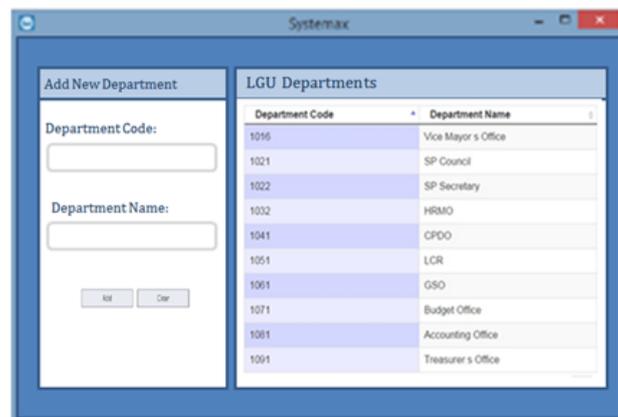


Fig. 6. Manage - LGU department

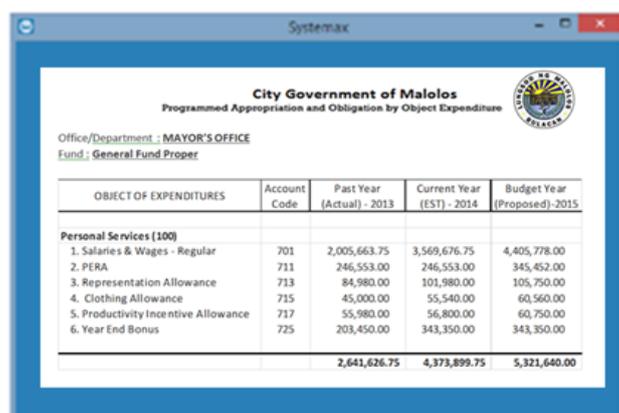


Fig. 7. Sample report

VII. CONCLUSION AND RECOMMENDATION

The over-all interpretation for the acceptability of the developed software in terms of usability, security, accuracy and user-friendliness was very good. The system was perceived to be useful in increasing the efficiency and effectiveness of managing LGUs budget-related transactions. Therefore, with technological breakthrough and advancement in ICT, the existing manual process would still be improved. Hence, the proposed system would provide better alternative to the existing current process.

Based on the findings of the research conducted, the local government units in the Philippines are ready to go online if the basis will be the availability of ICT particularly computer and Internet connectivity present in LGUs. However, constraints which are related to budget, presence of skilful IT persons and political drive may hinder the full automation of the different transactions in the government.

It is recommended that cities and municipalities maximize the availability of their IT infrastructures and come up with application systems such as budget monitoring system to provide better service to the public. In relation to this, LGUs may enter into a memorandum of agreement to IT state universities and colleges that are mandated to conduct extension services within their jurisdiction.

In relation to this, LGUs may enter into a memorandum of agreement to IT state universities and colleges within their jurisdiction. All higher education institutions (HEIs) are mandated to perform extension services to the community. The LGUs and HEIs may complement each other to come up with application systems that will be of great help to LGUs in performing its function to the fullest. Application system such as the budget monitoring system could strengthen government financial stability through enhancement of financial management.

ACKNOWLEDGMENT

The author wishes to acknowledge the support provided by the College of Information and Communications Technology and Bulacan State University in the development of this research. The author would also like to express gratitude to this research technical development team: John Terrence Mahor; Kerby Alcaraz; Ian Carlo Tolentino; Sean Paul Javier; and Cliff Richard dela Cruz.

REFERENCES

- [1] Pimentel Jr., A. (1991, October 10). Local Government Code of 1991 Republic Act 7160. Retrieved December 2014 from http://www.lawphil.net/statutes/repacts/ra1991/ra_7160_1991.html
- [2] Miravite, C. S (2014, April 14). New Government Accounting System of the Philippines (NGAS): On Decentralization [Blog post.] Retrieved from <http://csmiravite-blogs.hubpages.com/hub/NEW-GOVERNMENT-ACCOUNTING-SYSTEM-NGAS-OF-THE-PHILIPPINES-On-Decentralization>
- [3] Siar, S. (2005). E-governance in Philippine Local Government: Content Analysis of City Websites and Study of a Best Practice Case. *Philippine Journal of Development* 2005. 32(2).
- [4] National Information Technology Council (2009). Government Information Systems Plan. Manila, Philippines. Retrieved December 2014 from <http://www.ncc.gov.ph/files/gisp.pdf>
- [5] Mariano, V. D.(2006). Introducing Electronic Governance in the Philippines. Idea Group Inc. Retrieved January 2015 from <http://www.irma-international.org/viewtitle/11424>.
- [6] Ramos, F. (1997, November 7). Directing All Government Agencies and Instrumentalities Including Local Government Units to Undertake Electronic Interconnection through the Internet to be Known as RPWEB. Administrative Order No. 332. Retrieved December 2014 from www.ncc.gov.ph/files/Ao332.pdf
- [7] Padilla, J. (2005). The Electronic Commerce Act (R.A. 8792) An Overview of IT (Information Technology) Impact on the Philippine Legal System. Retrieved February 2015 from http://ustlawreview.com/pdf/vol.L/Articles/The_Electronic_Commerce_Act_RA_8792.pdf
- [8] Alampay, E. Incorporating participation in the Philippines' e- LGU Project. Retrieved December 2014 from <http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan034698.pdf>
- [9] National Computer Center. The 2006 LGU e-Governance Readiness Survey retrieved on November 2014 from <http://www.ncc.gov.ph/files/2006survey.pdf>
- [10] Ronda, R. A (2014, October 14) . 600 Municipalities to have Free Internet Next Year. *The Philippine Star*. Retrieved from <http://www.philstar.com:8080/headlines/2014/10/14/1379994/600-municipalities-have-free-internet-next-year>