

Barangay Blotter and Clearance System of Sta. Maria, Gonzaga, Cagayan, Philippines

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ABTRACT

The Barangay Blotter and Clearance System is a customized computer system specifically created for barangay use. The system will automate the barangay's day-to-day activities and transactions. The initiative would improve the barangay's services as well as the citizen's overall experience. The system will generate clearances or permits for the residents and record blotters easily. The system provides a user-friendly system for the employees of the barangay. The developers used the ISO 25010 standards model to evaluate the quality of the system. The result of evaluation in terms of functionality, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability of the developed system is excellent which means that the system can perform the task required and accomplished the objectives of the system. Based on the evaluation and trials conducted, the developed system gives a great help for the councilor/secretary of the daily task and in the process of recording filed blotters and releasing of permits to residents. Thus, it is recommended that the system will be fully implemented in the barangay particularly the barangay Sta. Maria of Gonzaga, Cagayan, as this will facilitate faster and efficient processing of the barangay blotter and clearances.

Keywords: Barangay Blotter System, Clearance Automation, Citizen Services Enhancement, ISO 25010 Evaluation

INTRODUCTION

Nowadays, computer and technology play a vital role in our lives and online communication is already part of living especially this time of the COVID19 pandemic. In the government, particularly at the barangay level, most of the barangays are still using paper-pencil to record the information of the residents. They do this day-by- day manually, which is very tiresome on the part of the record keepers or the barangay secretaries. In the past, it was easy to use paper because there were fewer residents and it was easy to manage them especially on managing their requested clearances and blotters in any incident. With the increasing barangay populations, blotter records and issuance of clearance is troublesome. Documents can be misplaced or worse is they are lost - in which case, documents lost are no longer retrievable.

Barangay Sta. Maria, until now, is using manual system. The barangay usually keeps their data hand-written on paper, and file it in a folder/logbook. Then the secretary will generate the list of all the names of an individual in a household in each purok, in hand-written again. In tracing the records, the secretary will search the records one by one search the from a filing cabinet and it takes a lot of time. These records are very important for different purposes thus should be stored securely.

Barangay Sta. Maria is aspiring to adopt technological ways in accomplishing responsibilities to create change in the life of people. It means replacing human efforts with machine to keep track of the advances of the technology.

As a result, the researchers create a system that will aid the difficulties in the barangay. The said system will reduce the hard and long-time procedure of accessing file, and will be effective in maintaining, searching, and storing of records and generating reports of the residents. The purpose of Barangay Blotter and Clearance System of Barangay Sta. Maria, Gonzaga, Cagayan is to generate clearances or permits for the residents and record blotters easily. The system will also provide a user-friendly system for the employees of the barangay. This proposed system is intended to archive the records of the resident, blotter, and barangay clearances. This system will bring ease to them, especially in generating reports to the municipality about the status of the barangay. The proposed system will have a significant on both of the residents of the barangay and barangay employees still who manage the system. The system offers an assurance that files will be protected and safe for users and it will also require authorization before someone can access the system. These systems are sufficient for various purposes that required an appropriate, consistent, and secured storage of files. With the assistance of technology, barangay officers can make and keep records, announcements, reports, reservations specified the residents can have records and access to them, the proposed system can access the users online. To ensure that the files are secure, a backup of data will be integrated as one of the modules of the proposed system.

Objectives of the Study

In general, this study focuses on the design, development and implementation of Barangay Blotter and Clearance System of Sta. Maria, Gonzaga, Cagayan. Its specific goals are as follows: determine the problems and issues encountered in the barangay blotter and clearances; make an online system to facilitate the barangay blotter and clearances; evaluate the developed system in accordance with ISO 25010:2011 - Systems and software Quality Requirements and Evaluation (SQuaRE) as to: Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, Portability.

MATERIALS AND METHODS

Research Design

The research employed a mixed-methods approach, incorporating both qualitative and quantitative methods. Initially, an on-site visit was conducted to interview the target community and gather insights into the project requirements. A formal written consent was obtained prior to the scheduled visit. Subsequently, personal interviews and observations were conducted with barangay officials to develop a foundational matrix function for the project's design.

Sampling Technique

The researchers selected the barangay as their study site due to the absence of operational systems within their operations. Convenience sampling was employed to select the barangay for this research.

Locale of the Study

The study was conducted in the chosen barangay, which was selected based on its need for an operational system to enhance its daily operations.

Research Instruments

Data collection instruments included interview guides for the personal interviews with barangay officials and a set of questionnaires for participants/users. The questionnaires were designed to assess various aspects of the system, including developed Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability. A 5-point Likert scale was used for rating, with 5 representing "excellent" and 1 representing "fair."

Data Gathering Procedure

Before any data collection commenced, formal written consent was diligently acquired from the target community. An on-site visit was then orchestrated to facilitate interviews with barangay officials and gain valuable insights into the specific requirements of the project. Through personal interviews and keen observations, a comprehensive matrix function was meticulously developed in collaboration with the barangay officials, which ultimately served as the bedrock for the project's design. Subsequently, questionnaires were thoughtfully disseminated among the participants and users to assess the system's performance, aligning with the rigorous standards set forth by ISO 25010. This

comprehensive approach ensured that the project was not only ethically grounded but also deeply attuned to the needs and expectations of the community it aimed to serve.

Analysis of the Data/Statistical Treatment

To analyze the results obtained during the testing phase of the system, a weighted mean was computed from the responses to the questionnaires. This facilitated an evaluation of various system attributes, including Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability, and Portability, as rated by participants/users.

System Architecture



Figure 1. System Architecture

As shown in Figure 1, the administrator of the system is in charge of accessing the system and controlling the residents' information, clearance, and blotter records.

RESULTS AND DISCUSSION

Features of the Barangay Blotter and Clearance System



Figure 2. Sign In page

The BBCS application's sign-in page is shown in Figure 2. Before any user may access the system, he or she must first sign in using his or her email address and password. After that, the user can now log in.

OTTER AND CLEARANC SYSTEM	 Dashboard 				Adminis
	158 Total Population	2 Active Case	O: Scheduled	1 Settled	
	More info O	More info 🛛	More info O	More	info 🕥 🗌
E Home	Barangay Officials			Resident Sta	tistics
	Name	Position	Chairmanship	Total	158
	JOSEPHINE G. GALLARDO	Barangay Captain		Male	88
	DINA M. SOUVA	Councilor 1	Committee on Appropriation VAW Desk Officer	Female	70
	MELANIO T. SAGARIO	Councilor 2	Committee on Infrastructure		

Figure 3. Home Page/Dashboard Page

The administrator dashboard is shown in Figure 3. As the administrator, he/she has complete control over the BBCS application. The Barangay Officials, resident data, total number of residents, and the status of the blotter reports are all displayed on the home page.

BLOTTER AND CLEARANCE	=					Administrator
SYSTEM	Resident List					
	Enter nome	All	Purok	Y Search	Clear Search	Add New Resident
	Full Name	Birthdate	Purok	Civil Status	Gender	Actions
🕷 Home	Benjamin Abordo	1944-11-09	Purok 6	Single	Male	Tot Delete Generate Clearance
Residents	Bonifacio Abordo	1987-01-04	Purok 6	Single	Male	Edit Delete Generalic Clearance
Lusers	Alicia Acido	1966-06-29	Purok 2	Single	Female	Est Delete Generate Cleatance
O Settings	Ryan Acido	1981-10-01	Purok 2	Single	Male	Edit Delete Generate Clearance
	Reysmith Acido	1999-12-24	Purok 1	Single	Male	Edit Delete Generale Clearance

Figure 4. The graphical user interface

Figure 4 shows the BBCS graphical user interface. After logging in as a user, he or she can now utilize and access the application's information. This page shows the information about the residents, and the user can update, delete, or add a new resident, as well as generate the resident's clearance request.

TER AND CLEARANCE	=						
SYSTEM	Resident List						
	reymark		All Purok		v	Search	Clear Search
			All Purok Purok 1 Purok 2				
	Resident Updated!		Purok 3 Purok 4				
Home	Full Name	Birthdate	Purok 5 Purok 6			Civil Status	
Residents			Purok 7	1.00000000	_		
Blotters	Benjamin Abordo	1944-11-09		Purok 6		Single	

Figure 5. Residents Page

Figure 5 shows the residents page, which allows users to search for residents by

entering their name and purok in the search field. There are 7 Puroks in Barangay Sta Maria.

	Resident List					
	reymark		All Purck	≺ Search 1	Char Search Add New Resident	1
	Full Name	Eirthdate	Purok	Civil Status	Gender	Actions
	Reymark Acido	1997-03-14	Purok 2	Single	Male	Ere Doors Generate Charges
Residents						
	setting 1 to 1 or 1 threes					

Figure 6. Residents Search Page

	Entername		furok 7	 Search One Search 	Add New Resident	
	Full Name	Birthdate	Purok	Civil Status	Gender	Actions
I	Dominador Arana	1969-12-10	Purok 7	Single	Male	Total Dateile Germania Charana
	Rema Azana	1973-04-02	Purok 7	Married	Fernale	terr Colore Generale Character
Residents	Daniel Arana	1991-06-25	Purok 7	Single	Male.	Tere Delete Generale Dearant
Elations	Deo Anana	1983-05-14	Purok 7	Single	Male	For Criste Generale Clearance
setingi	Darellyn Arana	2006-12-06	Purok 7	Single	Female	fot Deste Generate Clearance
	Orlando Amedo	1950-11-07	Purok 7	Single	Male	Sec. Cleaner Cleaner die Cleaner of
	Beatriz Amedio	1962-03-13	Purok 7	Single	Female	Edt: Dates Generals Courses
	Denicio Amedo	1993-11-10	Purok 7	Single	Male	Lot. Chiefe Generals Characte
	Gilbert Amedo	1995-07-24	Purok 7	Single	Male	Tate Chiefe Generale Characte
	Victor Amedo	1998-07-02	Purok 7	Single	Maie	Tata Driver Generatis Discourse

Figure 7. Purok Search Page

Figure 6 and 7 shows the search page where user can click on the resident or purok being search and shows the resident information.

CVCTCL4	First Name	
STSIEM	Jean Maryrose Nicole	
(Contraction of the second	Middle Name	
Nor A	Enter Middle Name	
	Last Name	
	Gedorio	
	Birth Date	
Residents	09/08/1999	
	Civil Status	
	Single	
	Gender	
	Female	
	Purok	
	Purok 1	
	Phone	
	09973065149	
	Submit Consel	

Figure 8. Add New Resident Page

Figure 8 shows the form where user can input the information of the new resident and submit to save and display the new residents' info. On figure 15 shows the new resident is added successfully. IPAS

2	S	Managathy of Groups Recording Tax Maria	Print		sneet of pape
		PES (# THE SANKES PERMIC ANALISM	Destination	All a financial with	Denies in
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Figure 9. Generate/Print Page

The resident page also can generate the request clearance of the resident and can be printed as shown in Figure 9.

 Blotter List			
Enter name	All Status	Search Cear Search Ac	Id New Blotter
Complainant	Respondent	Status	Actions
Bea May Naiclas	Larry Andaya	Scheduled on 2022-02-20 05:00	View Tatt Dates Surve
Nenita Sagario	Belinda Soriano	Settled	Vew Lot Delete Survey

Figure 10. Blotter Page

Figure 10, shows the blotter page where a user can access and manage the blotter reports of the residents of the barangay.

BLOTTER AND CLEARANCI SYSTEM	■ Blotter List					
	Enter name		All Status	¥	Search	Clear Search
			All Status Scheduled Active			
	Complainant	Resp	Settled		Status	
🖀 Home	Bea May Naidas	Larry	Andaya		Scheduled	ł

Figure 11. Blotter Search Page

User can also search residents name and status of the blotter on the search blotter page. In this page, the use can select on the status of the blotter in the search bar as shown in Figure 11.

KP Dates No.09		Print	1	sheet of pape
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Figure 12. Blotter Print Page

If the selected status of the blotter is "scheduled", the user can generate and print summon letter as shown in Figure 12.

Table 1. Results of Evaluation Testing by the expected users in terms of Functional Suitability

Indicators	Weighted Mean	Descriptive Value
Functional Suitability	(Completene	ess,
Correctness,Approprie	ateness)	
1. The set of		Evenellent
entire task required.	5	Excellent
2. The function covers all the specified task and user objectives.	4.8	Excellent
3. The function facilities the accomplishment of specifiedtask and objectives.	5	Excellent
Overall Weighted Mean	4.93	Excellent
Legend:	•	
4.20 – 5.00 Excellent	1.8	0 – 2.59 Good

4.20 – 5.00 Excellent 3.40 – 4.19 Very Satisfactory 2.60 – 3.39 Satisfactory

1.00 – 1.79 Fair

Table 1 shows the result of evaluation in terms of functionality done by the expected users of the system. From the results, the cumulative mean of 5 with a descriptive value of "excellent" means that the system can perform the tasks required and accomplished the objectives of the system.

The overall mean of 4.93 with a descriptive value of "excellent" means that the system meets its functionality. This implies that the developed system meets the requirements as to how it handles suitability, accurateness, interoperability, security of the system.

In terms of performance efficiency of the system as presented in Table 2, the results show that with the respondents' cumulative mean of 5 with a descriptive value of "excellent", the system can perform its functions and meet its requirements.

	Indicators	Weighted Mean	DescriptiveValue						
Pe	Performance Efficiency (Time Behavior,								
Res	ource Utilization, Capacity)								
1.	The response and processing times and throughput rates of a product orsystem, when performing its functions, meet requirements.	5	Excellent						
2.	The amounts and types of resourcesused by a product or system, when performing its functions, meet requirements.	5	Excellent						
3.	The maximum limits of the productor system, parameter meet requirements.	4.8	Excellent						
	Overall Weighted Mean	4.93	Excellent						
Lege	nd:								
4.20	– 5.00 Excellent 1.80 – 2.59 Good								

Fable 2. Results of Evaluation Testing	g by the expected u	isers in terms of Performa	nce Efficiency
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4.20 - 5.00 Excellent 3.40 – 4.19 Very Satisfactory

The overall mean of 4.93 with a descriptive value of "excellent" means that the system meets the demands of performance efficiency. This indicates that the developed system meets the requirements as how it handles maturity, fault tolerance and recoverability of the system. the requirements as how it handles maturity, fault tolerance and recoverability of the system.

The compatibility of the system is presented in Table 3. From the result of the evaluation done by the expected users of the system, the mean of 4.8 with a descriptive value of "excellent" means that the system can perform the accomplished objectives of the system.

Table 3. Results of Evaluation Testing by the expected users in terms of Compatibility

	Indicators	WeightedMean	DescriptiveValue
Com	npatibility (Co-existence, Interoperability)		
1.	A product can perform its required functions efficiently while sharing a common environment and resources with other products, without detrimental impact on any other product.	4.8	Excellent
2.	Two or more systems, products or components exchange information and usethe information that has been exchanged.	4.8	Excellent
	Overall Weighted Mean	4.8	Excellent

Legend: 4.20 – 5.00 Excellent 3.40 – 4.19 Very Satisfactory 2.60 – 3.39 Satisfactory

1.80 - 2.59 Good 1.00 – 1.79 Fair

In terms of performance efficiency of the system as presented in Table 2, the results show that with the respondents' cumulative mean of 5 with a descriptive value of "excellent", the system can perform its functions and meet its requirements.

The overall mean of 4.93 with a descriptive value of "excellent" means that the system meets the demands of performance efficiency. This indicates that the developed system meets The overall mean of 4.8 with a descriptive value of "excellent" means that the system is reliable compatibility, co-existence, if its and interoperability are evaluated. This implies that the developed system meets the requirements of compatibility, i.e., as to how it handles without detrimental impact any product and use of the information that has been exchanged into the system.

The usability of the system is presented in Table 4. From the result of the evaluation done by the expected users of the system, the mean of 5

^{1.00 – 1.79} Fair

^{2.60 – 3.39} Satisfactory

with a descriptive value of "excellent" means that the system can perform the tasks required.

The reliability of the system is presented in Table 5. The results show that the system can

Table 4.	Results	of Evaluation	Testing	by the ex	rpected	users ir	ı terms	of Usability	Į

Indicators	Weighted Mean	Descriptive Value
Usability (Appropriateness recognizability, Learnability, Operation Interface, Accessibility)	n, User error protec	ction, User
1. User can recognize whether a product or system is appropriate for their needs.	4.8	Excellent
2. A user learns how to use thesystem easily.	4.8	Excellent
3. A user uses the system withoutmuch effort.	5	Excellent
4. A user interface enables pleasingand satisfying interactions for the user.	4.8	Excellent
5. A product or system can be usedby people with widest range of characteristics and capabilities toachieve a specified goal in a specified context of use.	4.8	Excellent
Overall Weighted Mean	4.87	Excellent

Legend:

i weighten Mear

4.20 – 5.00 Excellent 1 3.40 – 4.19 Very Satisfactory 1 2.60 – 3.39 Satisfactory

1.80 – 2.59 Good 1.00 – 1.79 Fair

The overall mean of 4.87 with a descriptive value of "excellent" means that the system is usable when its appropriateness, recognizability, learnability, operation, user error protection, user interface, and accessibility are evaluated. This implies that the developed system meets the requirements as to how it handles error after failure.

perform the tasks required as indicated by the mean of 5 with a descriptive value of "excellent". This means that the system can recover from its failure or can recover the data of the system.

The overall mean of 4.85 with a descriptive value of "excellent" means that the system is reliable when its maturity, availability, fault tolerance and recoverability are evaluated. This implies that the developed system meets the

	Indicators	Weighted Mean	Descriptive Value
Reli	ability (Maturity, availability, Fault Tolerance, Recoverability)		
1.	A system, product or component meets for reliability under normal operation.	4.8	Excellent
2.	A product or system is operational and accessible when required for use	4.8	Excellent
3.	A system, product or component operates as intended despite the presence of hardware or software result.	4.8	Excellent
4.	In the event of an interruption or a failure, a product or system can recover the data establish the desired state of the system	5	Excellent
	Overall Weighted Mean	4.87	Excellent
Lege			

4.20 – 5.00 Excellent 3.40 – 4.19 Very Satisfactory 2.60 – 3.39 Satisfactory

1.80 – 2.59 Good 1.00 – 1.79 Fair requirements as to how it handles elimination of faults after failure.

The overall mean of 4.92 with a descriptive value of "excellent" means that the system is

Table 6. Results of Evaluation Testing by the expected users in terms of Securit	y
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	Indicators	WeightedMean	Descriptive Value
Sec Non	curity (Confidentiality, Integrity, -Repudiation, accountability,Authenticity)		
1.	The prototype ensures that dataare accessible only to those authorized to have access.	5	Excellent
2.	A system, product or component prevents unauthorized access to, ormodification of, computerprograms or data.	5	Excellent
3.	Actions or event can be provento have taken place, so that theevents or actions cannot be repudiated later.	4.6	Excellent
4.	The actions of an entity can betraced uniquely to the entity.	5	Excellent
5.	The identity of a subject or resources can be proved to be the one claimed.	5	Excellent
	Overall Weighted Mean	4.92	Excellent

Legend:

4.20 – 5.00 Excellent 3.40 – 4.19 Very Satisfactory 1.80 – 2.59 Good 1.00 – 1.79 Fair

2.60 – 3.39 Satisfactory

The security of the system is presented in Table 6. The result shows that the system can perform the tasks required as indicated by the mean of 5 with a descriptive value of "excellent".

secured when its confidentiality, integrity, nonrepudiation, accountability, and authenticity are evaluated. This implies that the developed system meets the requirements as to how it

Table 7. Results of Evaluation Testing by the expected users in terms of Maintainability

	Indicators	WeightedMean	Descriptive Value
Sec Non	curity (Confidentiality, Integrity, -Repudiation, accountability,Authenticity)		
1.	A system or computer program is composed of discrete components suchthat a change to one component has minimal impact on other components.	5	Excellent
2.	An asset can be used in more than onesystem, or in building others assets.	5	Excellent
3.	It is possible to assess the impact on a product or system of an intended change toone or more of its parts, or to diagnose a product for deficiencies or causes of failures, or to identity parts to be modified.	4.8	Excellent
4. qua	A product or system can be effectively and efficiently modified without introducing defects or degrading existing product ality.	5	Excellent
5.	Test criteria can e established for a system,product or component and test can be performed to determine whether those criteria have been met.	5.00	Excellent
	Overall Weighted Mean	4.96	Excellent

Legend:

4.20 – 5.00 Excellent 3.40 – 4.19 Very Satisfactory 2.60 – 3.39 Satisfactory 1.80 – 2.59 Good 1.00 – 1.79 Fair handles elimination of faults after failure.

The maintainability of the system is presented in Table 7. The result shows that the system can perform the accomplished objectives of the system as indicated by the mean of 5 with a descriptive value of "excellent".

The overall mean of 4.96 with a descriptive value of "excellent" means that the system is maintainable when its modularity, reusability, analyzability, modifiability, and testability are evaluated.

Table 8. Results of Evaluation Testing by the	Ģ
expected users in terms of Portability	

Indica	Weighted	Descriptive
tors	Mean	Value
Portability (adapta	bility, Install	ability,
Replaceability)		
1. A product or		
system can be		
effectively and		
efficiently be		
adapted for		
different or	F	Evcollont
evolving	5	Excellent
hardware,		
softwareor other		
operational or		
usage		
environments.		
2. A product or		
system can be		
successfully		
installed and/or	5	Excellent
uninstalledin a		
specified		
environment.		
3. A product or		
system can		
replace another		
specified software	F	Evallant
product for the	5	Excellent
same purpose in		
the same		
environment.		
Overall Weighted	5.00	Excellent
Mean		
Legend:		
4.20 – 5.00 Excellent	1	.80 – 2.59 Good
3.40 – 4.19 Very Satisfac	tory 1	.00 – 1.79 Fair
2.60 – 3.39 Satisfactory		

The portability of the system is presented in Table 8. The result shows that the system can perform the tasks required as indicated by the mean of 5.00 with a descriptive value of "excellent".

The overall mean of 5.00 with a descriptive value of "excellent" means that the system is portable when its adaptability, install ability, and replaceability are evaluated. This implies that the developed system meets the requirements as to how it handles error after failure.

CONCLUSIONS

The researcher concludes based on the results evaluated that the system will be a great help to the barangay because it makes a more efficient and effective manipulation of the barangay blotters and clearances compared to the manual system. It is also found out that the develop system is more reliable because it is more secured as regards to keeping of records. On the other hand, it will also make the operations in the barangay faster since it is a computer-based, thus, it minimizes time effort and energy.

RECOMMENDATIONS

It is then recommended that the developed system be utilized in the barangay to facilitate in the issuance of clearances and blotters to residents. Also, the barangay may consider of improving the computer systems in their office to maximize the use of the system.

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