WEB-BASED RESIDENTS' PROFILING SYSTEM OF THE LOCAL GOVERNMENT UNIT IN BILAR, BOHOL

College of Technology and Allied Sciences
BOHOL ISLAND STATE UNIVERSITY
Zamora, Bilar, Bohol

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WEB-BASED RESIDENTS' PROFILING SYSTEM OF THE LOCAL GOVERNMENT UNIT IN BILAR, BOHOL

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for the Degree in Bachelor of Science
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ABSTRACT

The study aimed to develop a Web-Based Residents' Profiling System of the Local Government Unit in Bilar, Bohol. According to the secretaries, due to the semi-manual method used in processing and recording the residents' profile and the number of population, they encountered the following problems: (1) difficulty in handling and managing the residents' profile; (2) difficulty in the retrieval and consolidation of the residents' profile which contributed to longer period of time in the generation of reports; and (3) the physical documents being prone to damage and loss since they are using paper documents or hard copies. With the problems identified, the developers intend to develop a system that would provide well-organized forms for data processing, recording, and managing of all the residents' profile. The system is developed with the following features: (1) integration of an online mechanism to use a centralized server for all the barangays in Bilar; (2) design and implementation of the following modules: (a) Profiling, (b) Data Management, (c) Administration; and (3) implementation of business intelligence techniques to assist the barangay and the municipality in making decisions. The developed system was implemented in the office, and the web usability was evaluated during testing and implementation. Based from the results in the web usability, the average weighted mean of the web usability questionnaire is 4.54 with the interpretation of "Excellent". The results imply that the respondents found the capabilities, functions, and ease of using the developed system to be excellent. Thus, a Web-based Residents' Profiling System of the Local Government Unit of Bilar, Bohol is highly recommended.

Chapter 1

THE PROBLEM AND ITS SCOPE

Rationale

As companies try to reach out further to a wider audience, website development has become even more in-demand in this past decade. Because a growing number of people rely on search engines to locate needs and research information, website development is continuously shifting and evolving to help present offerings and information to those looking. Understanding how technology has the power to influence, change, and affect how a user accesses, navigates and digests information on a website is an essential consideration, whether it is already existing in the business or if plans are made to build a new one from the ground up (MooreTech, 2022).

All municipalities, cities, towns and even villages need their own place on the world's digital map. Websites come hand in hand that is built with credibility, attract businesses, keep visitors on the website, and help everyone find what they are looking for. Residents can get updated information as to what is happening in their municipality.

The Local Government Unit of Bilar is a landlocked municipality in the island province of Bohol. It is composed of nineteen (19) barangays. These nineteen (19) barangays are capacitated on the mechanism of collecting and submitting data about the residents' profile. They are also assigned to report the total population

of their barangay to the DILG, MSWDO, MPDC and other departments that will need the records.

Presently, the secretaries of nineteen (19) barangays in Bilar are using the semi-manual method in processing and recording the residents' profile. Data were recorded using excel application. According to the secretaries, due to the number of population, they encountered the following problems: (1) difficulty in handling and managing the residents' profile; (2) difficulty in the retrieval and consolidation of the residents' profile contributed to longer period of time in the generation of reports; and (3) the physical documents being prone to damage and loss since they are using paper documents or hard copies. With the problems identified, the developers intend to develop a system that would provide well-organized forms for data processing, recording, and managing of all the residents' profile of the Local Government Unit in Bilar. This work focuses on designing a system to improve the semi-manual process used by the secretary of the different barangays in Bilar. Thus, a Web-based Residents' Profiling System of the Local Government Unit in Bilar, Bohol was developed.

Literature Background

The development of the computerized system was anchored on Article XIV, section 10 of the Philippines Constitution which states that:

> *"Science and technology are essential for national development and progress. The State shall give priority to research and development, invention, innovation, and their utilization, and to science and technology education, training, and services. It shall support indigenous, appropriate, and self-reliant scientific and technological capabilities, and their application to the country's productive systems and national life."*

The state, according to this article, should recognize the use of technology in nation building, such as computerization in data recording and file archiving of residents' profile. It is critical that the Local Government Unit should be connected with computer modernization in order to cope with the advancements of new technology. The designed online profiling must be able to deliver dependable information as well as simple and quick information requests in the office.

Concurrency control is one of the principles of database management system stated by Kilpeläinen (2001). Concurrency control concept comes under the Transaction in database management system (DBMS). It is a procedure in DBMS which helps for the management of two simultaneous processes to execute without conflicts between each other as these conflicts occur in multi user systems. It guarantees that proper results for concurrent operations are generated as rapidly as feasible. There were additional rules, procedures, design processes, and theories established to ensure the consistency of the components running concurrently. The system was used under operational restrictions, which often result in reduced performance. The operation's accuracy and consistency should be achieved with a high level of efficiency while without sacrificing performance. Proper file management is extremely beneficial during the creation of a system. Concurrency control was used in the created system by establishing rules that assure exact database data change. Furthermore, these rules and criteria ensure that data in the database, such as document information, will be amended only when necessary.

There are some related studies that are available and were used as references.

1. Web-based System for Japanese Local Political Documents of Japan (Ototake et al., 2018). This article intends to provide a web-based method for visualizing municipal politics in Japan. As a result, these must be turned into panel data and differences must be visualized by region or over time. The suggested system seeks to provide a comprehensive solution that satisfies all of these criteria. The developed system is similar to this study but with added feature in the recording of profile.
2. Profiling System for Depressive Disorder Patient using Web Based Approaches of Malaysia (Mazalan et al., 2012). The work of designing, developing, and implementing a depressive illness profile system is presented in this study. The suggested system, which employs a web-based approach, allows medical institutions that diagnose and treat patients with mental problems to begin using its automated medical record. The developed system is similar to this study but with added feature in the recording of profile.
3. The Senior Citizen Web-Based Profiling System of Malita, Davao Occidental (Geverola and Ugsang, 2018). This study covers the changes from manual to automate in which the user is able to manipulate the new system. The purpose of this study is to develop a computerized profiling system that upgrade and create automated registration process, identification card and generate demographic profile in each barangay.

The developed system is similar to this study but with added feature in the recording of profile.

4. Web-Based Barangay Information System of Malita, Davao Occidental (Aparici and Ruelan, 2018). This study was developed to automate the management of barangay household, commodities and population, populate barangay data to be viewed municipal webpage in order to monitor the increase and decrease of household, commodities and population for an immediate action, and establish geotagging of commodities for barangays. The developed system is similar to this study but with added feature in the recording of profile.
5. Web-Based Profiling and Growth Monitoring of Bohol Island State University Tree Farm in Zamora, Bilar, Bohol (Ancog et al., 2019). This study was developed for analyzing the process involved in profiling and monitoring and identifying the problems encountered. The develop system was designed to improve the present processes of the concerned department. The developed system is similar to this study but with added feature in the recording of profile.
6. Web Based Profiling System for MSWD Office in the Municipality of Loon, Bohol (Rama et al., 2019). This study was developed with the following module: Profiling, Data Management, Reporting, and Administration to improve the present process of the office. The developed system is similar to this study but with added feature in the recording of profile.

THE PROBLEM

Statement of the Problem

The study aimed to develop and implement an online system that will help the Local Government Unit of Bilar in the residents' profile.

Specifically, it sought to answer the following:

1. What are the processes and operations involved in residents' profile in the Local Government of Bilar?
2. What are the needs and problems encountered in the storage and retrieval of residents' profile?
3. What could be the possible solutions for the problems encountered in profiling?
4. What is the level of system acceptability as perceived by the target user?

The developed system is to be called the Residents' Profiling System and it will integrate the processes involved in the nineteen (19) barangays of Bilar. The system is developed with the following features:

1. Integration of an online mechanism to use a centralized server for all the barangays in Bilar;
2. Design and implementation of the following modules:
   a. Profiling
   b. Data Management
   c. Administration;

3. Implementation of business intelligence techniques to assist the barangay and the municipality in making decisions.

Scope and Delimitation

This study focuses on the development of a Web-Based Residents' Profiling System of the Local Government Unit in Bilar, Bohol. Specifically, the developed system covered only the following processes:

1. **Online mechanism:** Develop a web-based mechanism for sharing information regarding households, families and individual profile of the residents from barangays to the Local Government Unit in Bilar. This is used for centralizing one server to be used by the barangay secretary, DILG, MSWDO, MPDC and IT Personnel.
2. **Profiling:** This process involves entry of data by individual profiling of the residents in the locality, households, families, PWD's, senior citizen, solo parent, indigents and deceased.
3. **Data Management:** This feature involves managing, updating, and monitoring of the residents' profile. The data were presented in tabular and graphical form for effective and efficient recording.
4. **Administration:** This provides an administrative tool for the system maintenance. It also facilitates the management of users, privileges, and users' security. This system must have limited access depending on the user's account.

5. **Reporting:** This module generates tabular and graphical form of report such as latest population of a certain barangay and the municipality, age-sex structure, total number household, total number of family, total number of PWD's according to disability status, total number of senior citizen according to their condition, total number of solo parent, total number of indigents, and number of deceased. This report will serve as basis for the decision support of the DILG, MSWDO, MPDC and for the immediate action of the municipality to the communities.

The study was limited only to the standard operation and procedures in the barangay and the Local Government Unit in Bilar. The users of the system were also limited to the barangay secretary, DILG, MSWDO, MPDC and assigned IT personnel. The development of the system includes a module for storage databases as a storage of residents' profile.

Significance of the Study

The study led to the development of the Web-Based Residents' Profiling System of the Local Government Unit in Bilar, Bohol effectively by providing secure storage of documents in profiling of residents. Furthermore, the study would benefit the following:

Barangay Secretary. The secretary of the barangay is the one keeping and preparing a report for all the document of the barangay and this includes the barangay residents' profile. The profiling system can assist the barangay secretary

by logging into the online system and can enter, update, view and retrieve data of residents' profile at any time.

DILG, MSWDO, MPDC. They can provide reports such as latest population of household and individual, age-sex structure, sex desegregated by barangay, total number of PWD's according to type of disability, total number of senior citizen according to their condition, and population according to their work status.

IT Personnel. The IT Personnel is the administrator and in-charge in providing maintenance of the system and website.

Barangay Residents. The residents in the municipality will be able to access information on the website about the municipality's latest projects and announcements.

Researchers. For future researchers and developers, this study provides significant contribution in terms of profiling and website development. For the researchers of this study, it will enhance their reasoning and analytical abilities, to widen their knowledge in designing, and system development in preparation for their future job.

RESEARCH METHODOLOGY

Development Framework

Figure 1 shows the conceptual diagram that represents the Web-Based Residents' Profiling System of the Local Government Unit in Bilar, Bohol. It shows the input-process-output cycles, demonstrating how the data is processed in order to get a better output. The inputs are coming from the barangay secretary, DILG, MSWD, MPDC and assigned IT Personnel. The processes include profiling, data management, and administration. The output provides the decision support to the administration.

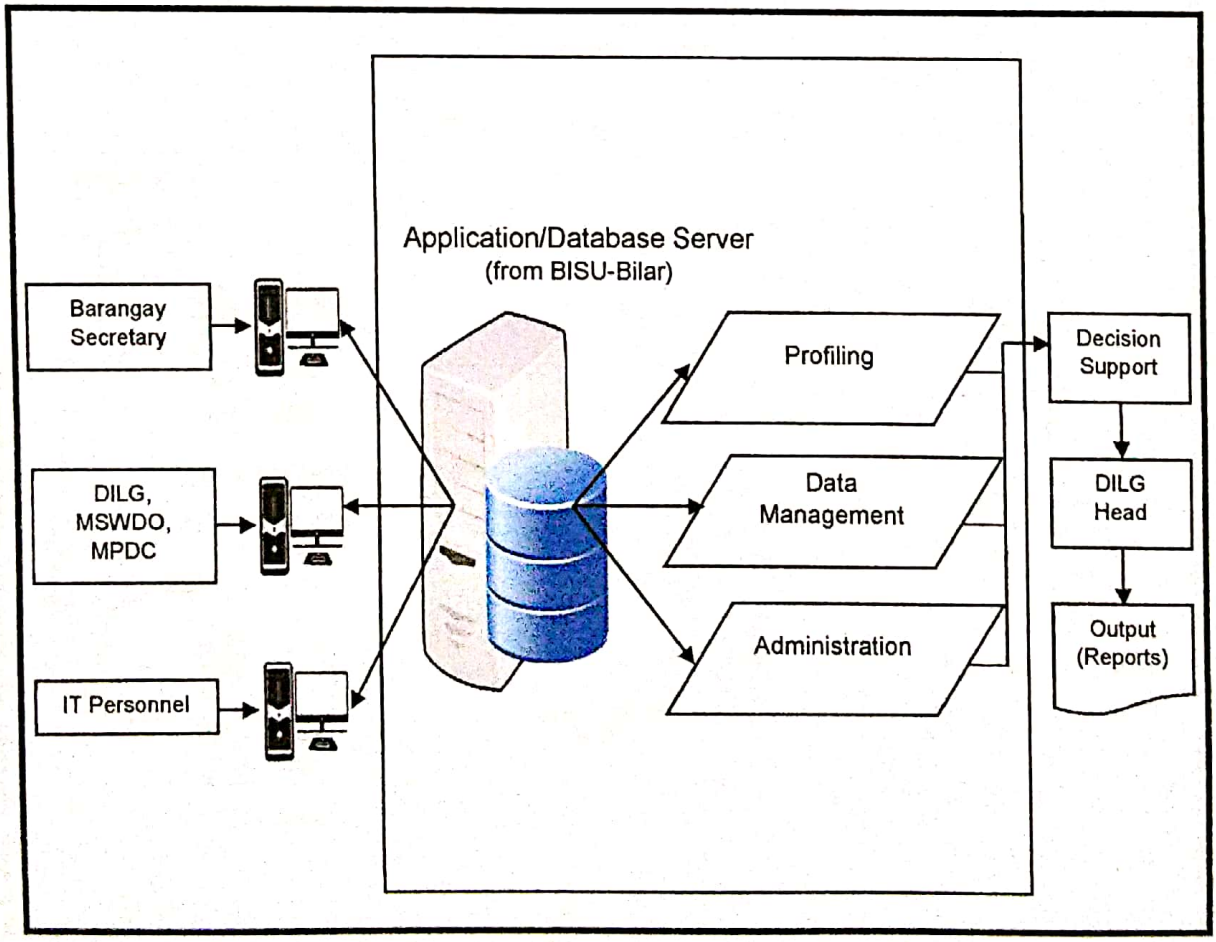


Figure 1. Conceptual Diagram of the Proposed System

Figure 2 below shows the block diagram of the Web-Based Residents' Profiling System of the Local Government Unit in Bilar, Bohol. It shows the basic functioning and displays each user's functionality in the developed system. The barangay secretary will gather and input residents' record profile of their barangay while DILG, MSWDO, and MPDC can generate these reports and view and search residents' profile of all barangays in Bilar while the assigned IT Personnel will provide maintenance of the system.

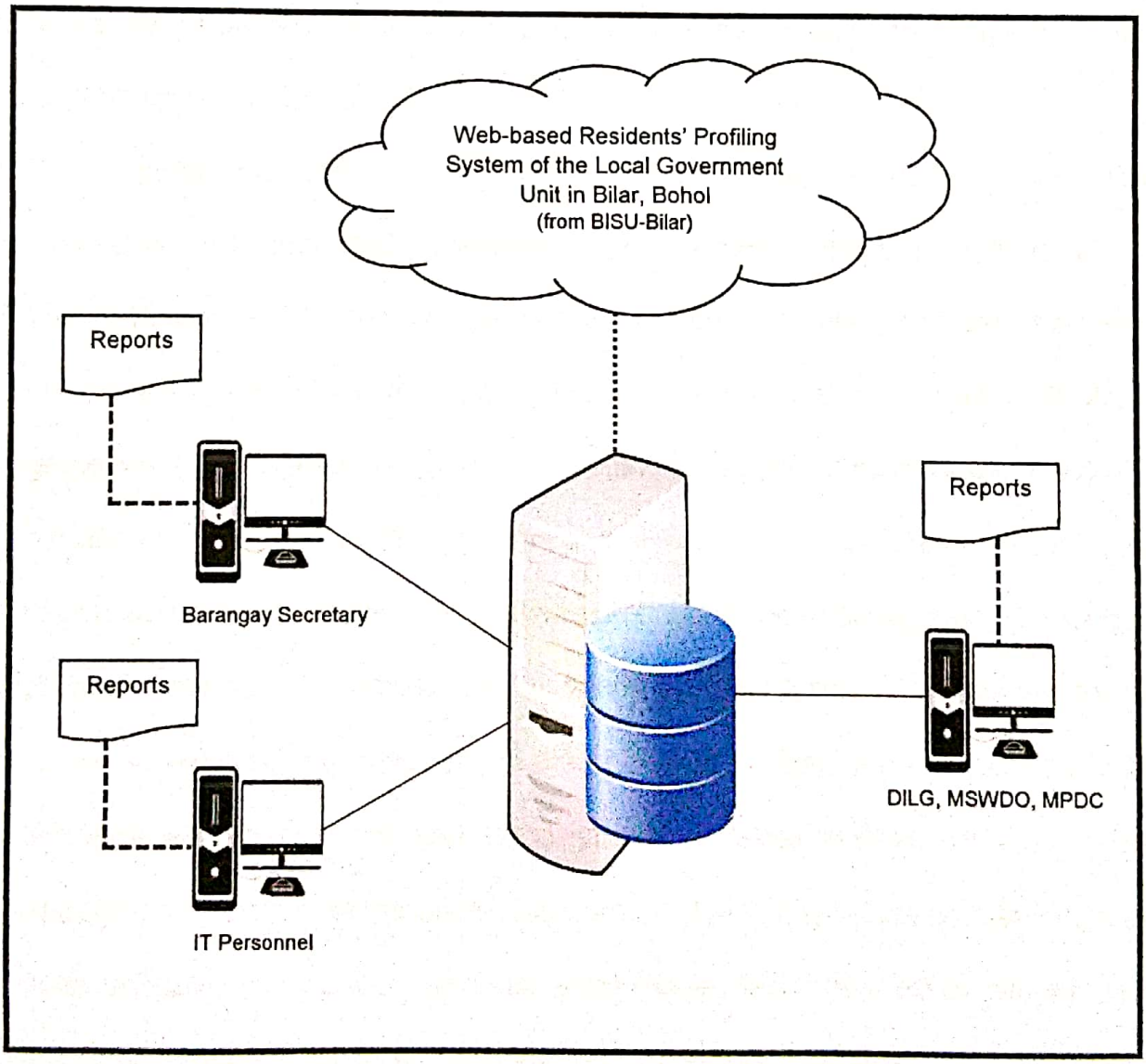


Figure 2. Block Diagram of the Developed System

Development Model and Approaches

In designing the software, the developers used Rapid Application Development Model (RAD Model) to develop a Web-Based Residents' Profiling System of the Local Government Unit in Bilar, Bohol. It focuses on prototyping and iterative development with no explicit planning. The process of writing software includes the product development planning. Rapid Application Development focuses on capturing user needs through workshops or focus groups, early testing of prototypes by the customer utilizing an iterative idea, reusing existing prototypes (components), continuous integration, and rapid delivery.

During the analysis and quick design phase, developers conducted interviews with identified respondents, performed document reviews as a benchmark activity of the forms utilized and reports generated, and observed how the office functioned in order to construct the prototype of the system built. After gathering the data needed, prototyping begins in designing tables and some fields needed by the system. This was done and evaluated several times to ensure that the result is correct and meets the office's processes and requirements. The testing phase focused on the software design where the user tests the system whether it suits their expectations. The refined prototype will evaluate the user until the final prototype is developed. The final stage is implementation, in which the system was deployed to the office of the Local Government Unit in Bilar. Data conversion, final tests, and user training were all done by the developers. While the developers and end-users continue to look for bugs and potential problems that need to be addressed right away, the finalization was completed.

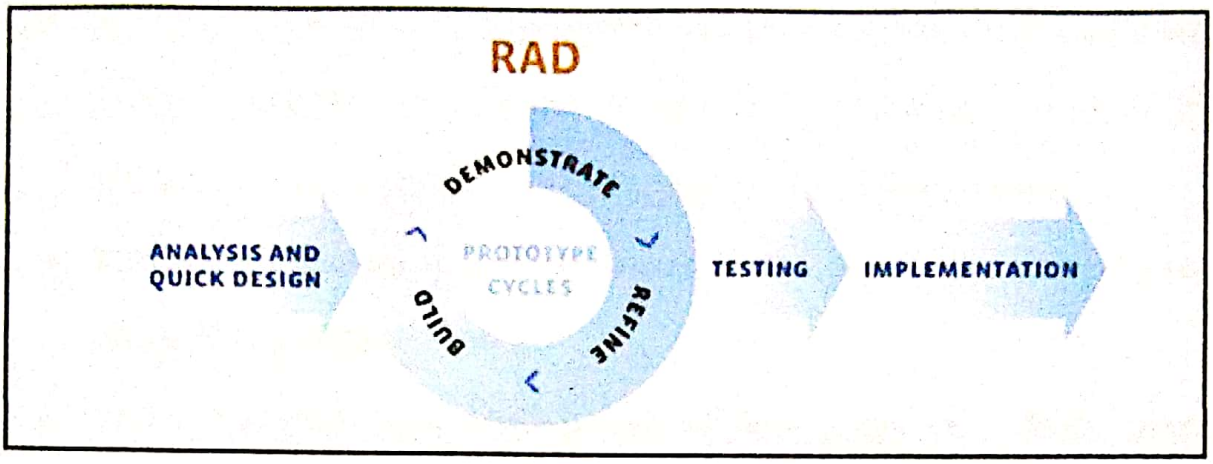


Figure 3. Rapid Application Development Model (RAD Model)

The following were the tools that was used in the development of the system:

1. **Hypertext Preprocessor (PHP)** – open source web developer use for creating websites. A widely used general-purpose scripting language that especially suited for web development into HTML, it was used in the scripting language. This is used making the online system of the develop study.
2. **WAMPP** – a Windows web development environment tool that allows creating web applications with Apache, PHP, and MySQL database that can be used to create an application on online viewing and data basing of the develop system.
3. **Sublime** – a source code editor or a text editor. It supports tabbed editing which allows working with multiple open files in single windows. It's used to edit PHP coding, which was utilized to create a web-based administration in the develop system.

4. **My Structured Query Language (MySQL)** – a system that works with ODBC and JDBC can use MySQL. It is used in the connectivity of the databases in the programming application of the develop system.
5. **Bootstrap** – an open source compiled CSS that make the develop system responsive for mobile surfing.
6. **CSS** – is a style sheet language use for adding style (e.g., fonts, colors, spacing) to the develop web documents.
7. **WordPress** – a free and open-source content management system developed in PHP that works in conjunction with a MySQL. This was used in designing the front-end of the develop system.

Environment and Participants

The study was conducted at the Local Government Unit in Bilar, Bohol that has a total land area of twelve thousand nine hundred seventy-one (12,971 hectares) and composed of nineteen (19) barangays. The participants of the study were the Barangay Secretary, DILG office personnel, MSWDO office personnel, MPDC office personnel and assigned IT Personnel. The developers conducted an interview and during interview, guide questions were used on how they process the procedure in managing residents' profile, where they kept the record, and who is responsible in gathering all the residents' profile information. The developers also asked for a document to review the data that is most needed and for guidance for a report that needs to be generated. During the visit, observation to the office was also conducted.

Data Collection

The developers made a letter request and asked permission to the Mayor of the Municipality of Bilar, Hon. Manuel G. Jayectin, for the approval in the gathering and reviewing of documents. To acquire the necessary information, personal interviews, document reviews, and observations were undertaken. Guide questions were used in the personal interviews to ask respondents about the operation and procedures in the residents' profile. During the document assessment, soft and hard files were assessed, as well as other forms utilized in the profiling of residents. Each form's template format, as well as its content was familiarized. Observation was also done on the different processes in recording the residents' profile.

Questionnaires were utilized as an instrument in the system and web usability studies to determine target users' perceptions of the system acceptability. The system's usability, operation, and features were presented to the target respondents in the system. The developers demonstrated the system's modules to the respondents and provided them with the system manual for them to be familiarized and guided with the system. The developers also stressed how the technology may assist them in accessing data via the system's search feature. After the presentations, respondents were given the opportunity to engage in hands-on activities with the system. Following the orientation and hands-on exercises, a questionnaire was distributed to evaluate the level of system and web acceptance. The respondents were given adequate time to assess the number of questions in the modified questionnaires. The respondents were composed of

twelve (12) Barangay Secretaries, one (1) DILG Head, one (1) MSWDO Head, one (1) MPDC Head, and three (3) IT Personnel, respectively.

The table 1 below shows the distribution of respondents for the system and web usability.

Table 1

Summary of Respondents

Respondents	No. of Respondents
Barangay Secretary	12
DILG Head	1
MSWDO Head	1
MPDC Head	1
IT Personnel	3
Total	**18**

The guide for the interpretation of the results of the system usability is presented in Table 2 below.

Table 2

Interpretation Guide of the System Usability

Weight	Range	Description	Interpretation
7	6.4 – 7.0	Strongly Agree	The respondents strongly believe and are confident that the system is very usable
6	5.5 – 6.3	Agree	The respondents believe and are confident that the system is usable
5	4.6 – 5.4	Tend to Agree	The respondents tend to agree that the system is usable
4	3.7 – 4.5	Neither Agree or Disagree	The respondents are neutral in trusting that the system is usable
3	2.8 – 3.6	Tend to Disagree	The respondents tend not to trust the system to be usable.
2	1.9 – 2.7	Disagree	The respondents believe that the system is not usable
1	1.0 – 1.8	Strongly Disagree	The respondents are strongly confident that the system is not usable.

The guide for the interpretation of the results of the web usability is presented in Table 3 below.

Table 3

Interpretation Guide of the Web Usability

Weight	Range	Description	Interpretation
5	4.2 – 5.0	Excellent	The respondents find the application excellent with regards in web usability standard
4	3.4 – 4.1	Very Good	The respondents find the application very good with minor inconsistencies and aesthetics
3	2.6 – 3.3	Good	The respondents find the system very good with noncritical errors causing confusion
2	1.8 – 2.5	Fair	The respondents find the system fair having serious problems that needs high priority to fix
1	1.0 – 1.7	Poor	The respondents find the system poor with severe problems

To determine the general acceptability of the system, the average weighted mean or then weighted mean score was computed to evaluate/assess the system and web acceptability level using the following formula:

$$WMS = \frac{1f_1 + 2f_2 + 3f_3 + 4f_4 + 5f_5}{n}$$

Where:

WMS = Weighted Mean Score

f_1 = Frequency of the respondents given a rate of 1

f_2 = Frequency of the respondents given a rate of 2

f_3 = Frequency of the respondents given a rate of 3

f_4 = Frequency of the respondents given a rate of 4

f_5 = Frequency of the respondents given a rate of 5

n = Total number of respondents

1 ,2...5 = constant (rating to the service provided)

The range of the interpretative guide for usability was computed by getting the interval value. The table above shows the interpretative guide that was used to describe the usability of the system.

OPERATIONAL DEFINITION OF TERMS

BHW. This refers to the Barangay Health Worker who collects data of household and individual.

DILG. This refers to the Department of Interior and Local Government who is one of the end-user of the developed system.

LGU. This refers to the Local Government Unit of Bilar where the study is being conducted.

MPDC. This refers to the Municipal Planning and Development Coordinator who is one of the end-users of the developed system.

MSWDO. This refers to the Municipal Social Welfare and Development Office who is one of the end-users of the developed system.

Profiling. This refers to extracting all information pertaining to the residents of the Local Government Unit in Bilar.

PWD. This refers to the people who are classified as Person with Disability.

RBI. This refers to the Record of Barangay Information that is commonly used in the barangay for recording of profile in every household.

Residents. This refers to the people who lives in the LGU-Bilar.

Web-Based Residents' Profiling System. A system designed and built for profiling of residents in the Local Government Unit of Bilar, Bohol. This is to make data recording and file archiving more convenient and easy to prepare with less hassle.

Chapter 2

PRESENTATION OF FINDINGS, ANALYSIS AND INTERPRETATION OF DATA

Existing Operations and Processes

The Local Government Unit of Bilar is composed of nineteen (19) barangays. Each barangay continues to use a semi-manual method in processing, recording, and managing the residents' profile by household and individual. The barangay secretary of the respective barangay is responsible for collecting data of the residents' profile. These are the following present processes that take place.

A. Barangay Health Worker Collect Information

Every household is surveyed by the Barangay Health Worker, who adds extra information about the household and its members. All this data is submitted to the barangay secretary.

B. Barangay Secretary Record Residents' Profile

The Barangay Secretary is equipped with a mechanism for recording data on household, household members, family and family members. However, the leader of the different organizations like solo parents, person with disabilities, senior citizens, and indigents are the one who collects and submit list of residents. The barangay secretary keeps all the data being collected and stored in RBI folder and Residents' File.

C. Barangay Secretary Submit Updated List

After completing all the information needed from the residents, they will submit it to the DILG, MSWDO, MPDC and other departments who will

request the record of the residents' profile. The records are keep in an individual folder namely Residents File, Households File, Families File, Solo Parents File, Senior Citizens File, PWDs File, and Indigents File. The barangay secretary submits only figures about household, family, and individual residents of their barangay.

D. Generate Reports

The barangay secretary prepares a report for the total no. of population in the barangay. For the profile report it is the total number of households, families, persons with disabilities, senior citizen, solo parents, and indigents. The reports generated is submitted to the DILG, MSWDO, MPDC and other departments who will need the records.

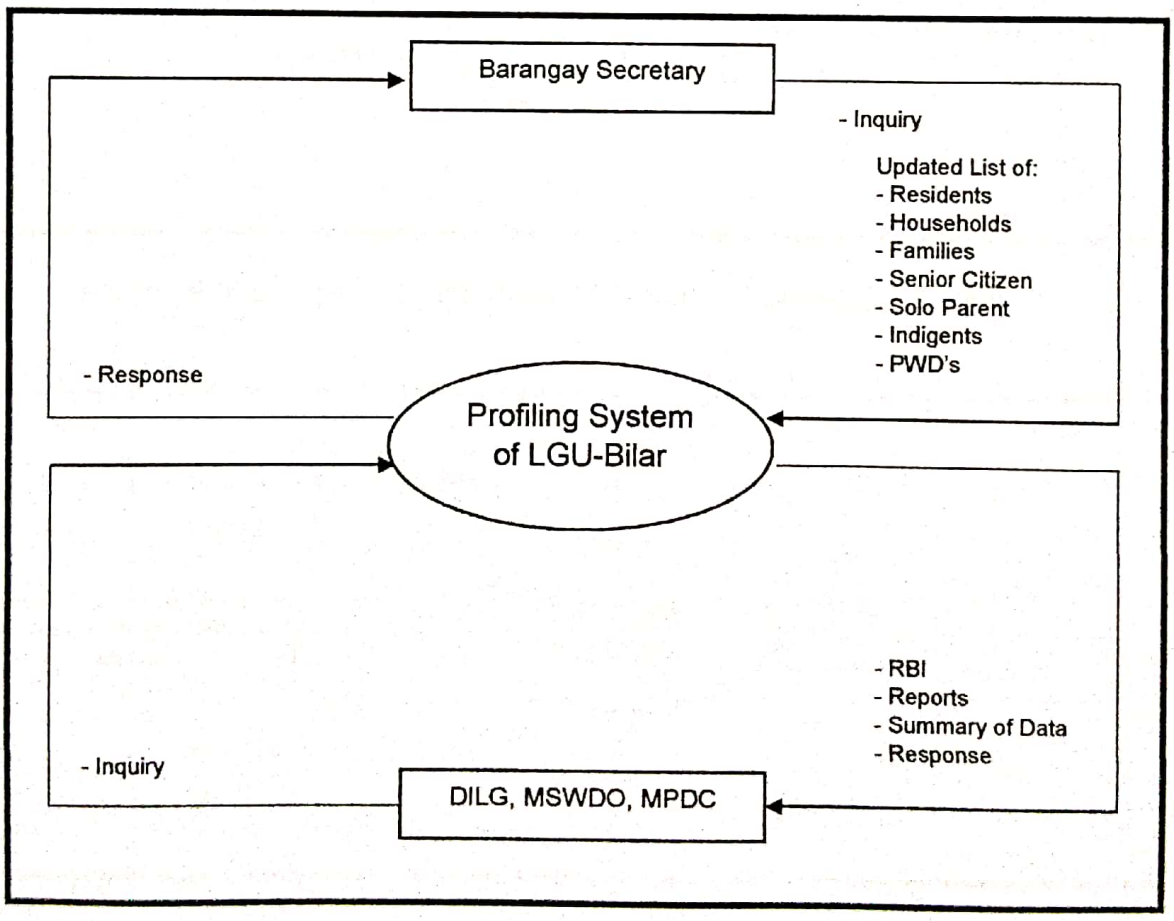


Figure 4. Context Diagram of the Present System

Event Specifications

Event list of the present system:

1. Barangay Health Worker Collect Information
2. Barangay Secretary Record Residents' Profile
3. Barangay Secretary Submit Updated List
4. Generate Reports

Event List Diagrams

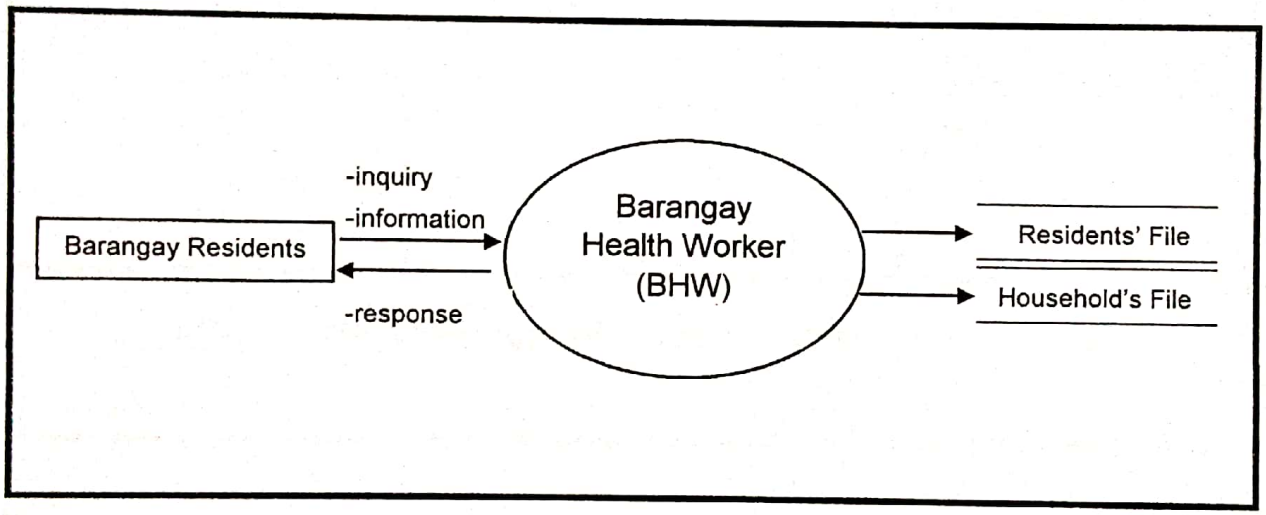


Figure 5. Barangay Health Worker Collect Information (Event 1)

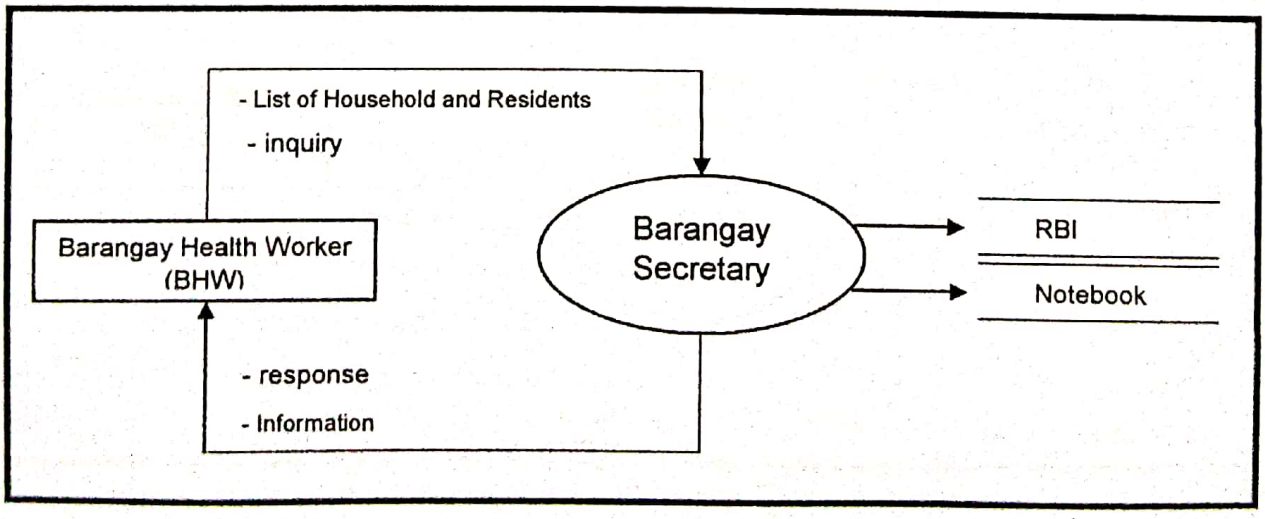


Figure 6. Barangay Secretary Record Residents' Profile (Event 2)

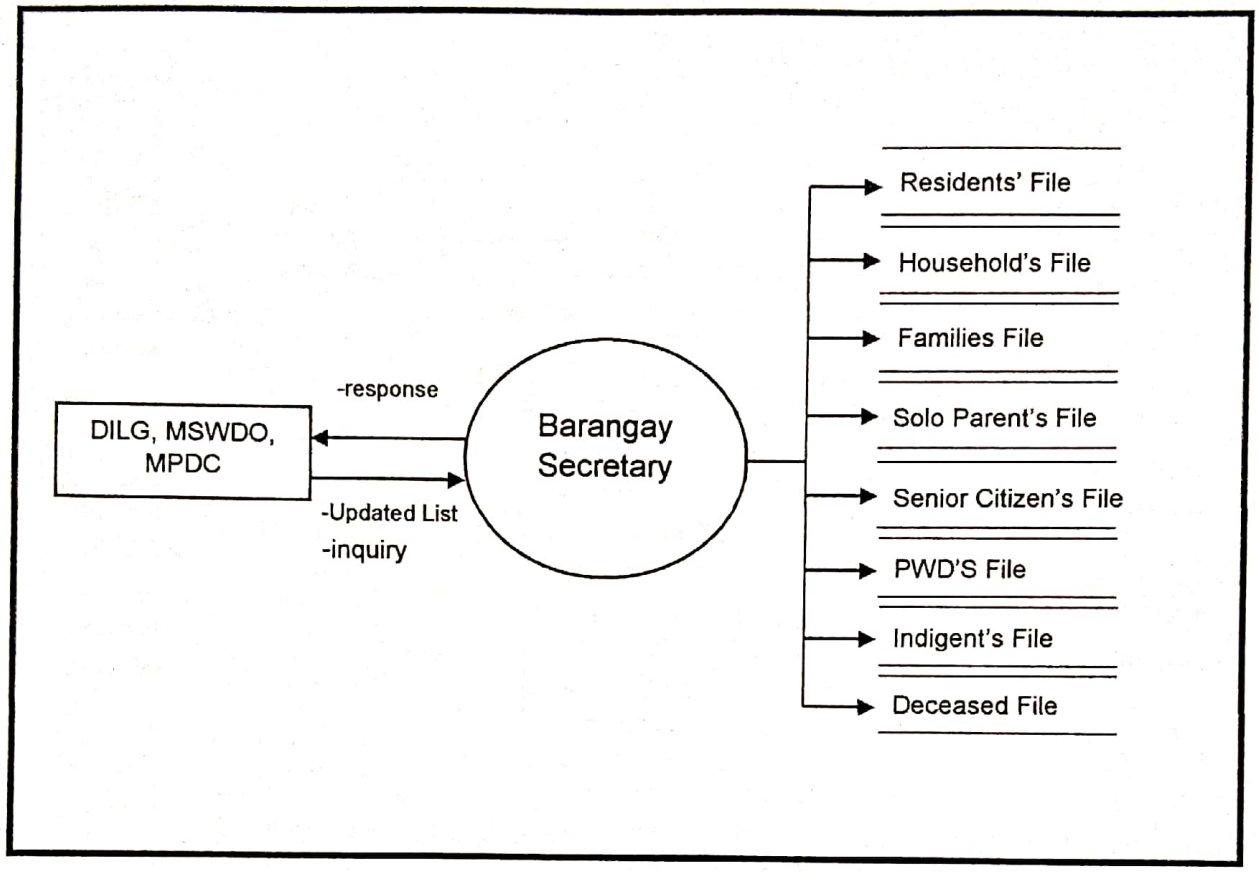


Figure 7. Barangay Secretary Submit Updated List (Event 3)

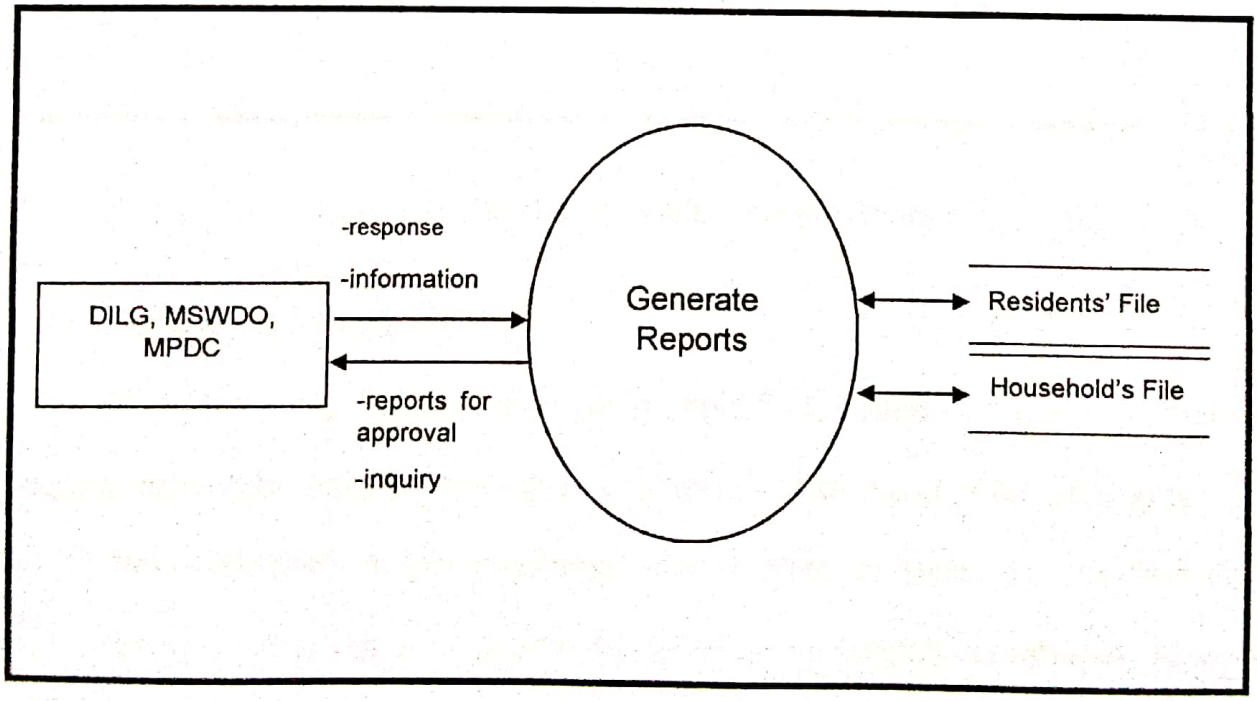


Figure 8. Generate Reports (Event 4)

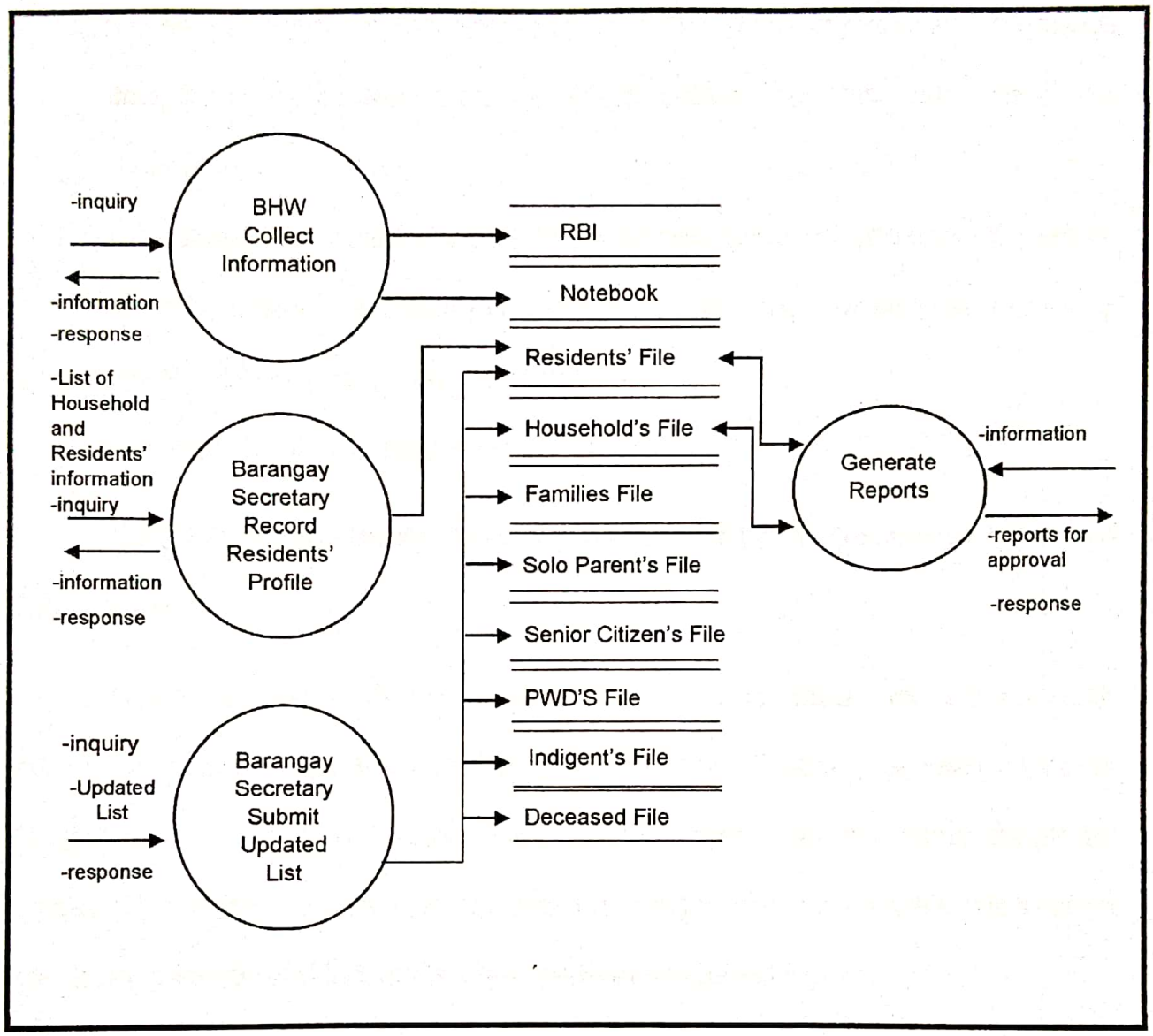


Figure 9. Top Level of the Present System

Needs of the Existing System

The following needs have been identified based on the developers' requirement gathering and analysis of the residents' profiling of the barangay:

1. Improvements in the recording and profiling of residents are required because it takes a long time to organize and input documents. Also, a deceased module will be added in order to easily track those who are deceased residents in a certain barangay. A systematic approach would be

to create an online mechanism that reduces the use of paper and integrates data into a database that can be accessed by those who need the information.

2. Data should be stored securely to avoid misplacement and loss of records. In some cases, the barangay secretary forgets the filename, so retrieving the files takes a long time.
3. Automate analysis and generation of report.

Web Based Residents' Profiling System of Local Government Unit of Bilar, Bohol

The developers gathered all of the data and information about the current system and developed the Web Based Residents' Profiling System of Local Government Unit of Bilar, Bohol based on their process for managing residents' profile. This system is designed to record, manage, and store profile information about households and individuals and generate required reports.

A. Profiling

The barangay secretary is responsible for recording residents' profile. He/she can input in the system whenever he/she wants. The barangay secretary in each barangay is only allowed to see their own barangay's record profile, they are not permitted to see the records of other barangays. The recording will be done by households and by individual. A unique id number is assigned in every resident that serves as its primary key. In households recording, the household head is the one to be inputted first before the member and it will be stored in tbl_households and the family

head that will be stored in tbl_families. If it is by individual, the solo parents will be stored in tbl_soloparent, senior citizen will be stored in tbl_seniorcitizen, indigents will be stored in tbl_indigents, PWD's will be stored in tbl_pwd. All of the aforementioned information will be stored in tbl_residents. If a certain resident is dead, then it will be added to the deceased list stored in tbl_deceased.

B. Data Management

The barangay secretary, DILG, MSWDO, MPDC can manage and update residents' profile. The assigned IT Personnel can only view/search residents profile. The system also displays who celebrates their birthday and will be shown on the website.

C. Generate Reports

The system will generate graphical and tabular form of report such as latest population of a certain barangay and the municipality, age-sex structure, total no. household, total no. of family, total no. of PWD's according to disability status, total no. of senior citizen according to their condition, total no. of solo parent, total no. of indigents, and no. of deceased. The reports generated is submitted to the DILG, MSWD, MPDC and other departments that will need the residents' profile and this will serve as basis for the decision making of Local Government Unit of Bilar, Bohol.

D. Administration

To ensure the security of the system's records and information, each authorized user needs to login in order to access their responsible module.

Username and password must be entered in log in form and if entered values match in the database tblaccount, the user may now access the system. The admin will determine the users' security whether it accepts or denies them. If access is granted, the authorized personnel of the DILG, MSWDO and MPDC can have fully access to the system while the barangay secretary and assigned IT personnel will be given a limited access to the system.

Use Case Diagram

A use case diagram is a visual representation of the different ways and possible scenarios of using a system. It illustrates how a user will perform actions and interact with a particular system, such as a website or an app (Venngage, 2022).

The entities involved in the system are the Barangay Secretary, DILG, MSWDO, MPDC, and IT Personnel. The barangay secretary can acquire profile, search residents' profile, displays record profile, and manage residents' profile, and handles the generation of reports in their respective barangay. The DILG, MSWDO, and MPDC can acquire profile, search residents' profile, displays record profile, and manage residents' profile. The DILG, MSWDO, and MPDC also handles the generation of reports in all barangays and the municipality, and administration processes such as addition, modification, and deactivation of users' accounts. The IT Personnel can only search and display residents' profile.

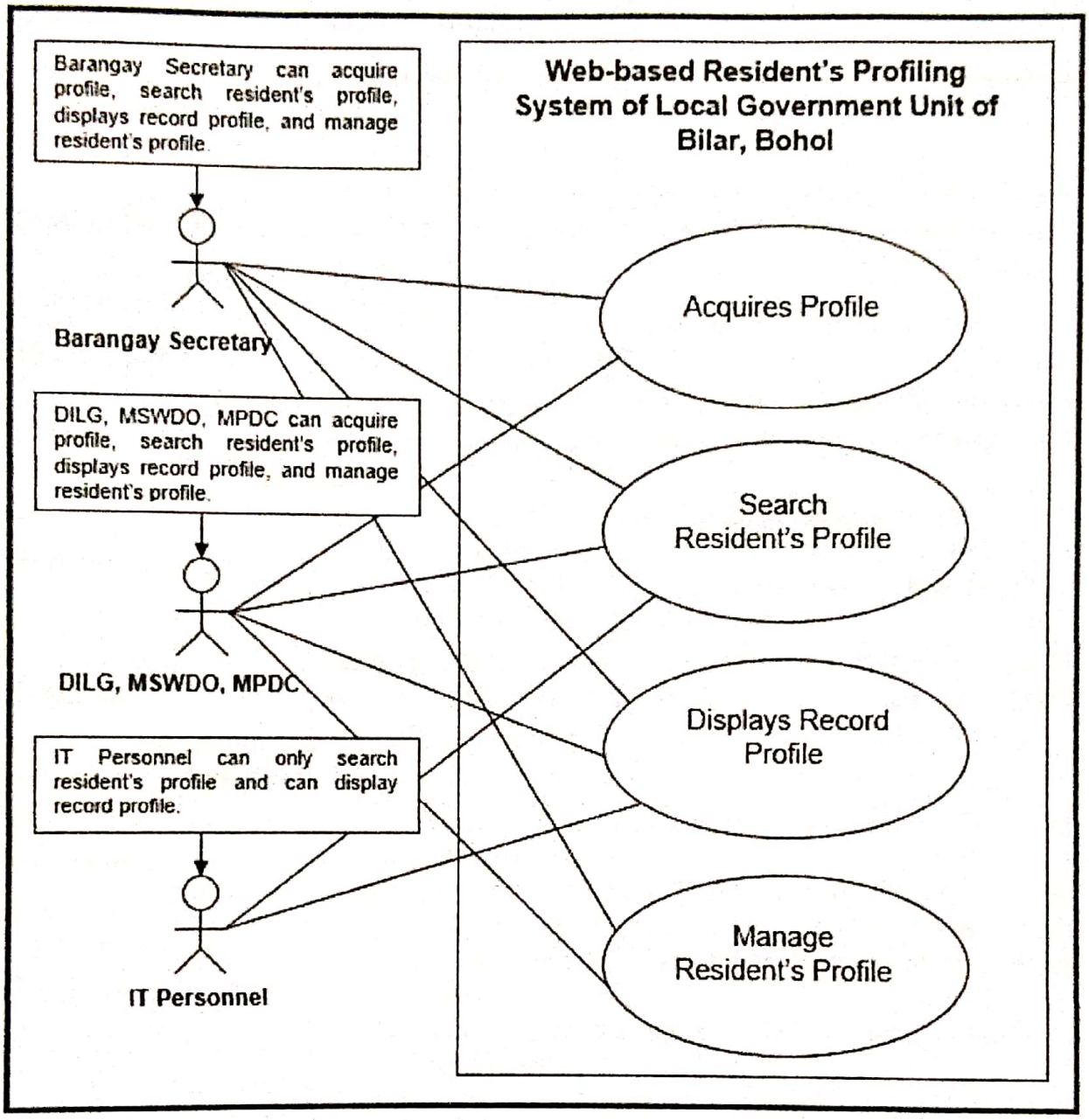


Figure 10. Use Case Diagram of the Proposed System

Use Case Narrative

Use case narrative describes a use case that requires both frame context of the use case and describe the dialog between the user (actor or use case) and then use case. In every use case narrative there are Pre-conditions, Process and Post-condition.

Table 1. Use Case 1 – Acquires Profile

Acquires Profile (UC1)	
Level	User Goal
Goal in Context	To present a menu which allows barangay secretary to acquires profile on household, family, member, and deceased
Primary actor	Barangay Secretary
Secondary actor	DILG, MSWDO, MPDC
Stakeholders	Barangay Secretary, DILG, MSWDO, MPDC: wants to add new household, family, household member, and deceased
Preconditions	1. Required field must be filled up completely. 2. In the absence of barangay secretary, the DILG, MSWDO, MPDC will have the authorization in acquiring the residents' profile.
Triggers	Barangay Secretary select Households in the main menu for the recording of household, family and household member, and Deceased tab for Deceased Recording
Success Guarantee	The new household will be recorded in the system.
Main Success Scenario:	1. Barangay Secretary: Select Household Tab in the main menu 2. System: Display a Form to input new household with the household head profile, family head profile, household member profile, and deceased profile 3. Barangay Secretary: Fill the information needed in the System 4. System: Add new household head, family head and household member, and deceased in the system
Extensions: None	

Table 2. Use Case 2 – Search Residents' Profile

Search Residents' Profile (UC2)	
Level	User Goal
Goal in Context	To present a menu which allows barangay secretary, DILG, MSWDO, MPDC and assigned IT personnel to search residents' profile

Stakeholders	Barangay Secretary, DILG, MSWDO, MPDC and IT Personnel: wants to search profile
Preconditions	None
Triggers	Barangay Secretary, DILG, MSWDO, MPDC, IT Personnel select Residents' Tab in the menu.
Success Guarantee	The system will show them the profile of the resident.
Main Success Scenario:	1. Barangay Secretary, DILG, MSWDO, MPDC, IT Personnel: Select residents' tab in their menu 2. System: Present a Filter button 3. Barangay Secretary, DILG, MSWDO, MPDC, IT Personnel: Input the name 4. System: Show profile.
Extensions: None	

Table 3. Use Case 3 – Display Record Profile

Display Record Profile (UC3)	
Level	User Goal
Goal in Context	To present a menu which allows barangay secretary, DILG, MSWDO, MPDC and assigned IT personnel to view/display residents' profile
Stakeholders	Barangay Secretary, DILG, MSWDO, MPDC and IT Personnel: wants to view/display the profile
Preconditions	None
Triggers	Barangay Secretary, DILG, MSWDO, MPDC, IT Personnel select Residents' Tab in their menu
Success Guarantee	The system will display the profile of the resident.
Main Success Scenario:	1. Barangay Secretary, DILG, MSWDO, MPDC, IT Personnel: Select residents' tab in their menu 2. System: Present a Filter button 3. Barangay Secretary, DILG, MSWDO, MPDC, IT Personnel: Input the name 4. System: Display record profile.
Extensions: None.	

Table 4. Use Case 4 – Manage Residents' Profile

Manage Residents' Profile (UC4)	
Level	User Goal

Goal in Context	To present a menu which allows barangay secretary to retrieve and update record profile
Primary actor	Barangay Secretary
Secondary actor	DILG, MSWDO, MPDC
Stakeholders	Barangay Secretary, DILG, MSWDO, MPDC: wants to retrieve and update record profile
Preconditions	In the absence of the barangay secretary, the DILG, MSWDO, MPDC will have an authorization in managing the residents' profile.
Triggers	Barangay Secretary select Households in the main menu and click edit button for changes, same in the senior citizen, solo parent, PWD's and indigents
Success Guarantee	The system will save the changes in the profile.
Main Success Scenario:	1. Barangay Secretary: Select Household tab in the main menu to search the name and click edit button to make changes, the same in the senior citizen, solo parent, PWD's and indigents 2. System: Presents an edit button 3. Barangay Secretary: Change and update information 4. System: The system will save the changes
Extensions: No need for the user to update the age of a resident because the system will automatically update it every day. When the age reaches 60 then they will automatically be transferred to the senior citizen list.	

Table 5. Use Case 5 – Generate Reports

Generate Reports (UC5)	
Level	User Goal
Goal in Context	To present a menu which allows Barangay Secretary, DILG, MSWDO, MPDC and IT Personnel to generate reports
Primary actor	Barangay Secretary, DILG, MSWDO, MPDC and IT Personnel
Stakeholders	Barangay Secretary, DILG, MSWDO, MPDC and IT Personnel: wants to generate report
Success Guarantee	Web-Based Profiling System: waits for user input
Triggers	Barangay Secretary, DILG, MSWDO, MPDC and IT Personnel Select Reports in the Main Menu and choose the appropriate reports they need in the options

Main Success Scenario:	1. Barangay Secretary, DILG, MSWDO, MPDC and IT Personnel: Select Reports option in the main menu 2. System: Present a tabular and graphical tab 3. Barangay Secretary, DILG, MSWDO, MPDC and IT Personnel: choose the desired report they want to generate 4. System: present an output which is the reports
Extensions: None	

Table 6. Use Case 6 – Administration

Administration (UC6)	
Level	User Goal
Goal in Context	Present a menu which allows the DILG, MSWDO and MPDC to add and manage account
Primary actor	DILG, MSWDO and MPDC
Stakeholders	DILG, MSWDO and MPDC: wants to manage account
Preconditions	None
Triggers	DILG, MSWDO and MPDC select User Account in the main menu
Success Guarantee	The system will save the changes in the user account
Main Success Scenario:	1. DILG, MSWDO and MPDC: Select User Account tab in the main menu 2. System: Present a form to input and manage user account 3. DILG, MSWDO and MPDC: Fill the information needed, change and update user account information 4. System: The system will add new user account and save the changes
Extensions: None	

Database Design

Database design is a set of processes that aid in the creation, development, implementation, and upkeep of enterprise data management systems. A well-

designed database is simple to maintain, improves data consistency, and saves money on disk storage space. The database designer determines how the data elements must be related and what information must be stored.

Class Diagram

A class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operation (or methods), and the relationships among the objects (Fowler, M. 2018).

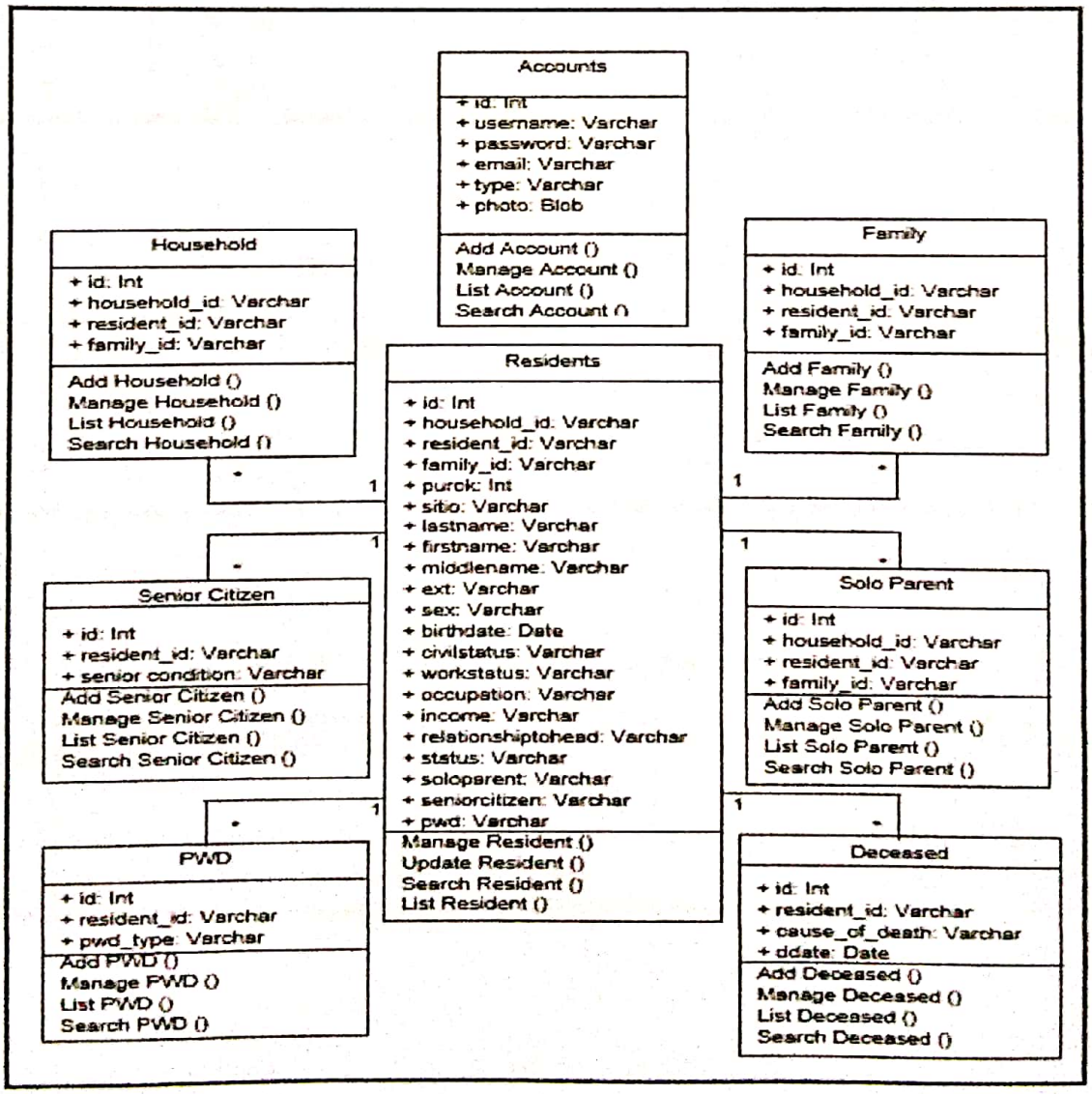


Figure 11. Class Diagram

Database Structure

The following tables below shows the database structure of the developed system where the important data and information needed by the Web-Based Residents' Profiling System of Local Government Unit of Bilar, Bohol.

Table 4

Database Structure Used for System Security – Log in

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	5	Record No
2	username	Varchar	50	Username
3	password	Varchar	60	Password
5	email	Varchar	60	Email
6	type	Varchar	40	Type
7	photo	Blob		Photo

Table 5

Database Structure Used for PWD

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	5	Record No
2	resident_id	Varchar	50	Resident ID
3	pwd_type	Varchar	80	PWD Type

Table 6

Database Structure Used for Senior Citizen

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	50	Record No
2	resident_id	Varchar	50	Resident ID
3	senior_condition	Varchar	50	Senior Condition

Table 7

Database Structure Used for Indigent

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	3	Record No
2	resident_id	Varchar	30	Resident ID
3	household_id	Varchar	30	Household ID
5	family_id	Varchar	50	Family ID

Table 8

Database Structure Used for Solo Parent

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	3	Record No.
2	resident_id	Varchar	30	Resident ID
3	household_id	Varchar	30	Household ID
4	family_id	Varchar	20	Family ID

Table 9

Database Structure Used for Deceased

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	50	Record No
2	resident_id	Varchar	50	Resident ID
3	cause_of_date	Varchar	50	Cause of Death
4	ddate	Date		Date

Table 10

Database Structure Used for Household

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	5	Record No
2	household_id	Varchar	30	Household ID
3	resident_id	Varchar	30	Resident ID
4	family_id	Varchar	30	Family ID

Table 11

Database Structure Used for Family

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	3	Record No
2	resident_id	Varchar	30	Resident ID
3	household_id	Varchar	30	Household ID
4	family_id	Varchar	20	Family ID

Table 12

Database Structure Used for Residents

FIELD	FIELDNAME	TYPE	WIDTH	DESCRIPTION
1	id	Integer	5	Record No
2	natl	Varchar	50	National ID
3	brgy	Varchar	20	Barangay
4	household id	Varchar	50	Household ID
5	resident_id	Varchar	50	Resident Id
6	family_id	Varchar	50	Family ID
7	purok	Varchar	2	Purok
8	sitio	Varchar	100	Sitio
9	lastname	Varchar	100	Last Name
10	firstname	Varchar	100	First Name
11	middlename	Varchar	100	Middle Name
12	ext	Varchar	20	Extension
13	sex	Varchar	20	Sex
14	placeofbirth	Varchar	100	Place of Birth
15	birthdate	Date		Birth Date
16	civil_status	Varchar	80	Civil Status
17	citizenship	Varchar	50	Citizenship
18	religion	Varchar	100	Religion
19	work_status	Varchar	50	Work Status
20	occupation	Varchar	100	Occupation
21	income	Varchar	30	Income
22	relationshiptohead	Varchar	20	Relationship to Head
23	status	Varchar	20	Status
24	soloparent	Varchar	10	Solo Parent
25	seniorcitizen	Varchar	50	Senior Citizen
26	pwd	Varchar	50	PWD

Program Hierarchy

A program hierarchy is a chart which shows the breakdown of a system to its lowest manageable levels. As a design tool, it aids the developers in dividing and conquering a large software problem, that is, recursively breaking a problem down into parts that is small enough to be understood by human brain.

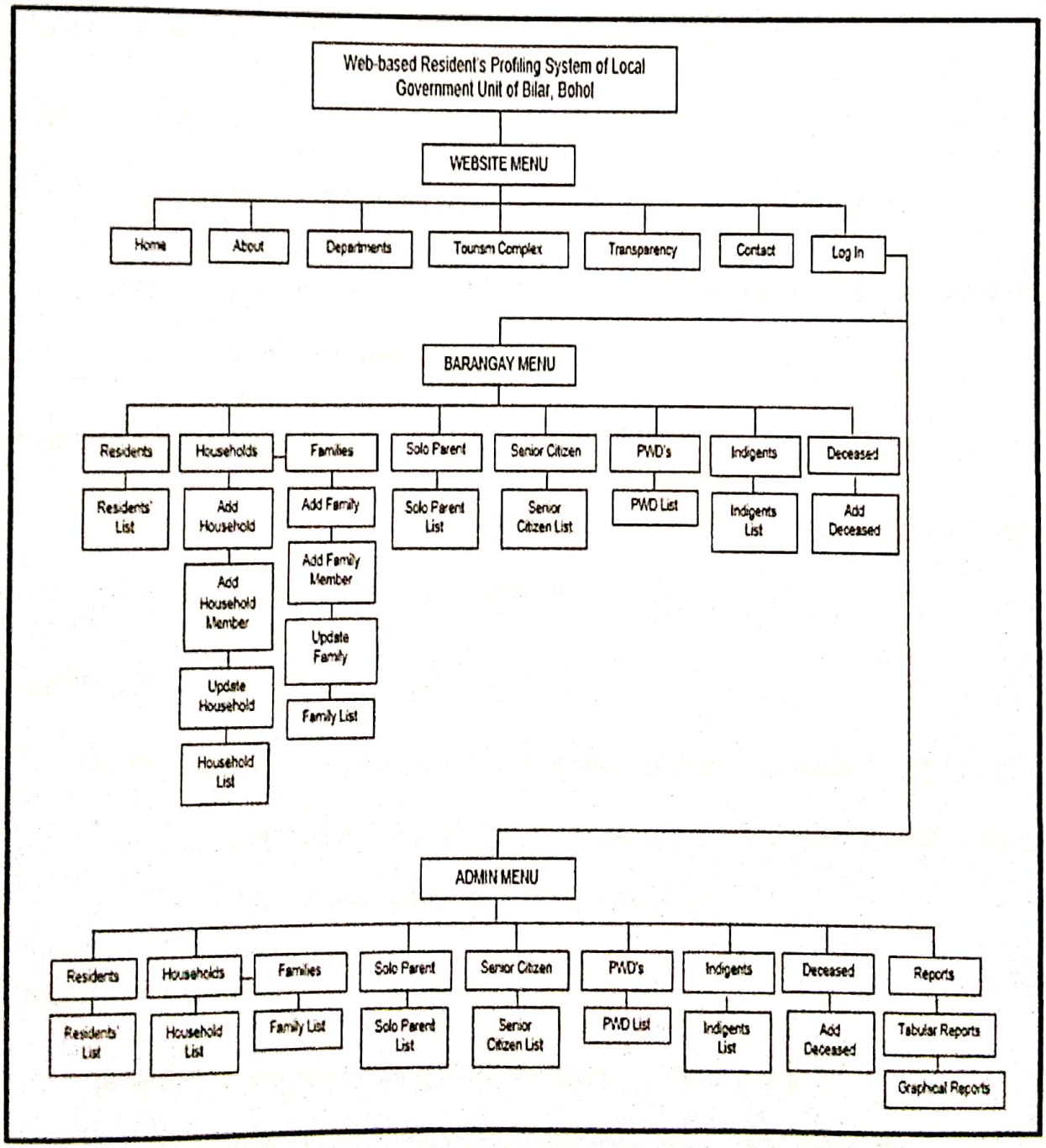


Figure 12. Program Hierarchy

Functional Requirements

A functional requirement specifies a function of a software system or a component of a software system. A function is defined as a collection of inputs, behavior, and outputs. Calculations, data manipulation and processing, and other specialized tasks that the system is expected to execute are examples of functional requirements. The functionalities of the system are as follows:

Login Process

FREQ 1. Access to the system must be password protected.

FREQ 2. All the data and information should be in a secure environment, limiting access to authorize only.

Recording Process

FREQ 3. The system should allow barangay secretary to record and manage residents' profile.

Updating Residents' Profile Process

FREQ 4. The system should allow the barangay secretary, DILG office personnel, MSWD office personnel, DILG office personnel to update the residents' profile information.

Data Management Process

FREQ 5. The system should automatically update every day since someone must be celebrating their birthday, and when that person reaches

the age of 60, the system must automatically place them in the senior citizen list.

FREQ 6. The system should display an error message to alert the user.

Generate Report Process

FREQ 7. The system should generate report graphical and tabular for fast analysis and decision support of the DILG, MSWD and MPDC.

FREQ 8. The system should generate report graphical and tabular for the barangay secretary.

Non-Functional Requirements

A non-functional requirement is one that defines criteria for judging the functioning of a system rather than particular actions. This should be contrasted with functional requirements, which describe precise function behavior.

NFREQ 1. Unauthorized users must be kept out of the system by using a username and password.

NFREQ 2. The system must be available at all times.

NFREQ 3. The system should function in accordance with the hardware and software specifications.

NFREQ 4. The system must be user-friendly, clear, and simple to operate.

Test Cases

A test case is a sequence of basic tasks that must be completed in order to verify a certain capability or feature of an application. It is a collection of variable circumstances that a tester will use to assess if a software system or one of its components is performing properly or not. It may run tests to ensure that a requirement is completely met.

Test Case 1.

Module: Record New Household

Severity 1

Instructions:

1. Go to "Household Tab" in the sidebar menu.
2. Fill the information in Add Household Form.
3. Click the "Register" button.

Expected Results:

1. New Household is added with the household head profile.
2. The new household will pop up in the list of household below the form.

Test Case 2.

Module: Record Household Member

Severity 1

Instructions:

1. Go to "Household Tab" in the sidebar menu.
2. Search in the list of Household the household head.
3. Click the "Search Button" beside the head information. All the household member will be shown.
4. Fill information needed in the "Household Member Information" to add new member.
5. Click "Register" button.

Expected Results:

1. The new household member is added, and it appears in the list of residents.

Test Case 3.

Module: Record Family

Severity 1

Instructions:

1. Go to "Household Tab" in the sidebar menu.
2. Click the "Add Family Button".
3. Search the household head in the List of Household.
4. Fill the information needed in the "Family Information" to add new family.
5. Click "Register" button.

Expected Results:

1. The new family is added, and it appears in the list of family form below.

Test Case 4.

Module: Solo Parent

Severity 1

Instructions:

1. Go to "Solo Parent Tab" in the sidebar menu.

Expected Results:

1. The list of solo parent will appear and the profile is found in the residents list of the system.

Test Case 5.

Module: Senior Citizen

Severity 1

Instructions:

1. Go to "Senior Citizen Tab" in the sidebar menu.

Expected Results:

1. The list of senior citizen will appear and the profile is found in the residents list of the system.

Test Case 6.

Module: Person with Disabilities

Severity 1

Instructions:

1. Go to "PWD's Tab" in the sidebar menu.

Expected Results:

1. The list of person with disabilities will appear and the profile is found in the residents list of the system.

Test Case 7.

Module: Indigents

Severity 1

Instructions:

1. Go to "Indigents Tab" in the sidebar menu.

Expected Results:

1. The list of indigents will appear and the profile is found in the residents list of the system.

Test Case 8.

Module: Record Deceased

Severity 1

Instructions:

1. Go to "Deceased Tab" in the sidebar menu.
2. Click "Search Button" to search for the resident.

3. Fill in the information needed.
4. Click "Register" button.

Expected Results:

1. The deceased person is added to the list of deceased and the profile is found in the residents' list of the system.

Test Case 9.

Module: Edit Record for Household

Severity 1

Instructions:

1. Go to "Household Tab" in the sidebar menu.
2. Search for the Household head and click "view" button beside the head information.
3. The household information will show including the household member.
4. Choose for the name you want to have changes, then click "Edit" button beside the person information.
5. All information will be filtered in the text boxes. All you have to do is change the mistaken information and click "Register" button.

Expected Results:

1. The changes are successfully saved. You can check it in the table list below the form.

Test Case 10.

Module: Edit Record for Family

Severity 1

Instructions:

1. Go to "Household Tab" in the sidebar menu.
2. Click the "Add Family" button.
3. Search for the Family head and click "View" button beside the head information.
4. The family information will show including the member.
5. Choose for the name you want to have changes, then click "Edit" button beside the person information.
6. All information will be filtered in the text boxes. All you have to do is change the mistaken information and click "Register" button.

Expected Results:

1. The changes are successfully saved. You can check it in the table list below the form.

Test Case 11.

Module: View and Search Profile

Severity 1

Instructions:

1. Go to "Residents Tab" in the sidebar menu.
2. All the residents will show in a table.
3. If you want to search a person's profile just type the last name, first name, middle name or resident id, and it will show the data you are searching for in this table.

Expected Results:

1. The table list will show the record.

Test Case 12.

Module: Generate Reports

Severity 1

Instructions:

1. Go to "Reports Tab" in the sidebar menu
2. It will show the tabular and graphical report for the total no. of population and individual, age bracket, sex desegregated, senior citizen, PWD, indigents, and deceased.
3. It will show the report using PDF.
4. Click "Print" button if you want to print it.
5. Click "Export to Excel" if you want to export it in an excel application.

Expected Results:

1. Clean up: Click "Print" if you want to continue and click "Cancel" if you don't want to print it.

Technical Requirements

Appropriate hardware and software component selection, as well as identification of personnel participating in the operation, are required for effective operation so that the system may be used to its maximum potential.

Hardware components are the physical components of a computer system. The microprocessor, random access memory, and hard disk drive are examples of these. While using the Internet Connection to execute an online application. Thus, these components were just specified in the presentation.

Software is the general name to all programs, documentations, and routines that are essential to make the computer usable. It is simply the components to make the computer run. Like Windows, Sublime, MySQL, and Browsers.

People are the users who engage with the system. It should be able to perform the task in order to test the system's efficacy. The users include the barangay secretary of the 19 barangay in Bilar, Bohol and the DILG, MSWDO, MPDC personnel. This group is in charge of recording information on homes and household members, as well as producing reports.

Minimum Hardware Specification

Component	Specification
Microprocessor	Intel Celeron
Hard Disk Drive	120 gigabytes
Random Access Memory	2 gigabytes, DDR2
Internet/Wi-Fi Router	2.1 GHz band, Wireless/LAN
Android	Quad Core 1.2GHz
iPhones	1.4 GHz

This section describes the minimal hardware requirements for the system to work effectively. These parameters were chosen based on what was available on the market and what most computer package systems provided. The top five hardware components must be considered when purchasing a personal computer for the system to work. These components work together to ensure that data is processed quickly and accurately. The rest of the hardware components will follow.

Minimum Software Specification

To perform effectively, the Web-Based Residents' Profiling System for Local Government Unit of Bilar requires a variety of applications. This software is listed below, along with its specs. The specs provided were based on the specifications of the computer units used during the system's development.

Component	Specification
Operating System	Runs on any devices with browser application and in any operating system.
Web Browser	Any internet browser
Android	Version 5 or later
iOS	Version 10 or later
Microsoft Excel	Version 2010 – present

Hosting and Implementation

Web hosting is a form of internet hosting service that allows people and organizations to publish their websites on the internet. Web hosting companies provide clients with space on a server that they own or lease, as well as internet connectivity, typically in a data center, whereas implementation is the

programming and deployment of a technical specification or algorithm as a program, software component, or other computer system.

In order to host and apply the built system, the developers used a domain and web hosting owned by BISU-Bilar, allowing the upload of the establishment's database and web page for testing. The developers were granted access to the Web-Based Residents' Profiling System for the Local Government Unit of Bilar as well as hosting for websites on virtual servers.

Individuals and businesses can use web hosting to make their website available via the World Wide Web. The system could be accessed through http://www.lgubilar.bisubilar.org/.

Business Intelligence Integration

Business intelligence (BI) refers to the technology tools, and techniques used to gather, integrate, analyze, and display enormous amounts of data in order to make better decisions (Cody, et. al, 2002).

The developed system is capable of analyzing data and generating statistical reports through tabular and graphical reports. These generated tabular and graphical reports maybe used by the office head as basis for monitoring the population of LGU-Bilar. These data were based from the 30% of the total population of the year 2022.

Preview 1 below shows the tabular report for the latest population by Household and Individual.

Republic of the Philippines
Region VII Central Visayas
Municipality of Bilar
Bilar, Bohol, Philippines 6317

SUMMARY OF REPORTS YEAR 2022

Barangay	Total No. of Residents	Total No. of Households	Total No. of Families	Total No. of Solo Parent	Total No. of Senior Citizen	Total No. of PWD	Total No. of Indigents	Total No. of Deceased
Bugang Norte	0	0	0	0	0	0	0	0
Bugang Sur	0	0	0	0	0	0	0	0
Bonifacio	0	0	0	0	0	0	0	0
Cabacnitan	62	43	46	10	0	0	44	0
Cambigsi	2	1	1	0	1	0	1	0
Campagao	0	0	0	0	0	0	0	0
Cansumbol	2	1	1	0	1	0	1	0
Dagohoy	12	9	9	3	2	1	8	3
Zamora	6	4	4	1	4	0	4	0
Riverside	0	0	0	0	0	0	0	0
Poblacion	0	0	0	0	0	0	0	0
Roxas	5	2	3	0	1	0	3	0
Quezon	0	0	0	0	0	0	0	0
Villa Aurora	0	0	0	0	0	0	0	0
Villa Suerte	0	0	0	0	0	0	0	0
Yanaya	12	7	7	0	5	0	5	2
Owac	8	4	6	3	4	2	5	0
Subayon	0	0	0	0	0	0	0	0
Rizal	0	0	0	0	0	0	0	0
Total	**109**	**71**	**77**	**17**	**18**	**3**	**71**	**5**

Preview 1. Latest Population of Household and Individual Report

Preview 2 below shows the tabular report for the Population Age Group by Sex.

Republic of the Philippines
Region VII Central Visayas
Municipality of Bilar
Bilar, Bohol, Philippines 6317

Summary of Reports for Population Age Group by Sex (Year 2022)

Age Group	Male	Female	Total
Under 1 year	0	0	0
1 - 4	1	0	1
5 - 9	0	0	0
10 - 14	1	0	1
15 - 19	0	1	1
20 - 24	3	3	6
24 - 29	3	0	3
30 - 34	3	2	5
35 - 39	0	1	1
40 - 44	0	2	2
45 - 49	0	1	1
50 - 54	0	3	3
55 - 59	6	4	10
60 - 64	6	1	7
65 - 69	0	0	0
70 and above	0	0	0
Total	32	20	52

Prepared by:

KATRINA OPPUS
Secretary

Certified Correct:

ANNA MARJORIE OMAC

Preview 2. Population Age Group by Sex

Preview 3 below shows the tabular report for the Sex Desegregated by Barangay.

Republic of the Philippines
Region VII Central Visayas
Municipality of Bilar
Bilar, Bohol, Philippines 6317

Summary of Reports for Sex Desegregated by Barangay (Year 2022)

Barangay	Male	Female	Total
Bugang Norte	0	0	0
Bugang Sur	0	0	0
Bonifacio	0	0	0
Cabaenitan	5	2	7
Cambigsi	1	1	2
Campagao	0	0	0
Cansumbol	1	1	2
Dagohoy	7	5	12
Zamora	2	4	6
Riverside	0	0	0
Poblacion	0	0	0
Roxas	4	1	5
Quezon	0	0	0
Villa Aurora	0	0	0
Villa Suerte	0	0	0
Yanaya	8	2	10
Owac	4	4	8
Subayon	0	0	0
Rizal	0	0	0
Total	32	20	52

Prepared by:

KATRINA OPPUS
Secretary

Preview 3. Sex Desegregated by Barangay

Preview 4 below shows the tabular report for the Total No. of Person with Disability According to their Type of Disabilities.

Republic of the Philippines
Region VII Central Visayas
Municipality of Bilar
Bilar, Bohol, Philippines 6317

Summary of Reports for the No. of Person with Disability According to their Type of Disabilities (Year 2022)

Type of Disability	Male	Female	Total
Deaf or Hard of Hearing	0	0	0
Intellectual Disability	0	0	0
Learning Disability	0	0	0
Mental Disability	0	0	0
Orthopedic Disability	0	0	0
Physical Disability	0	0	0
Psychosocial Disability	0	0	0
Speech and Language Impairment	0	0	0
Visual Disability	0	0	0

Prepared by:

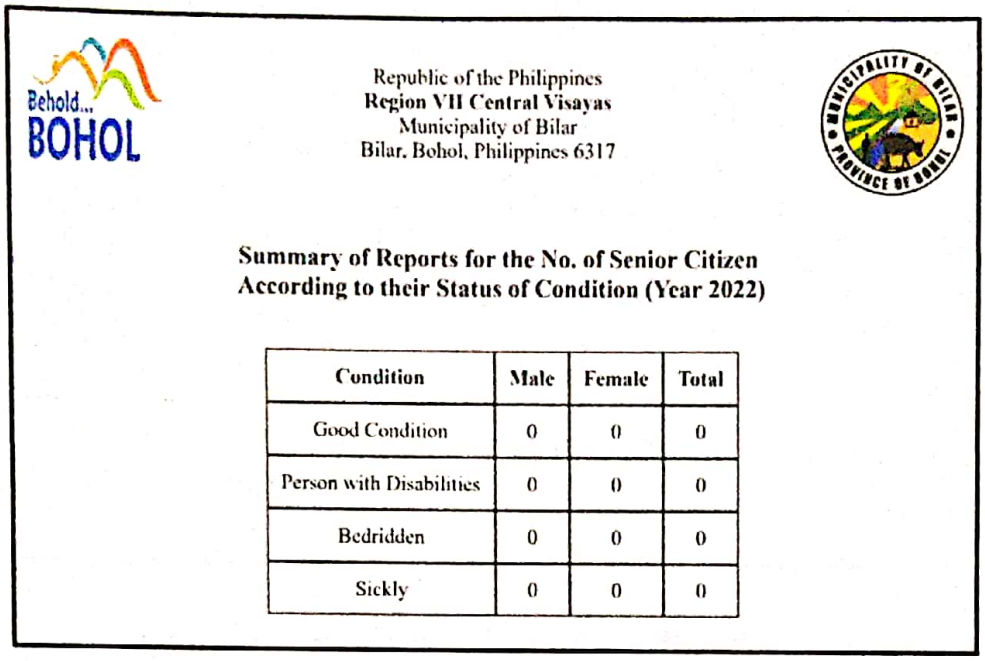
KATRINA OPPUS
Secretary

Certified Correct:

ANNA MARJORIE OMAC
Head

Preview 4. Total No. of Person with Disability According to their Type of Disability

Preview 5 below shows the tabular report for the Total No. of Senior Citizen According to their Status of Condition.



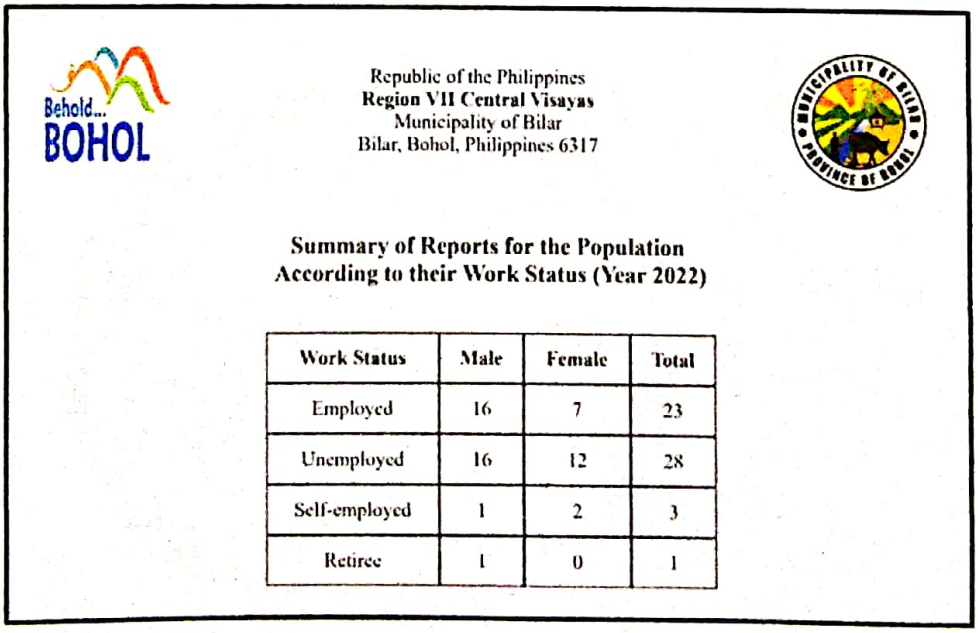
Republic of the Philippines
Region VII Central Visayas
Municipality of Bilar
Bilar, Bohol, Philippines 6317

Summary of Reports for the No. of Senior Citizen According to their Status of Condition (Year 2022)

Condition	Male	Female	Total
Good Condition	0	0	0
Person with Disabilities	0	0	0
Bedridden	0	0	0
Sickly	0	0	0

Preview 5. Total No. of Senior Citizen According to their Status of Condition

Preview 6 below shows the tabular report for the Population According to their Work Status.



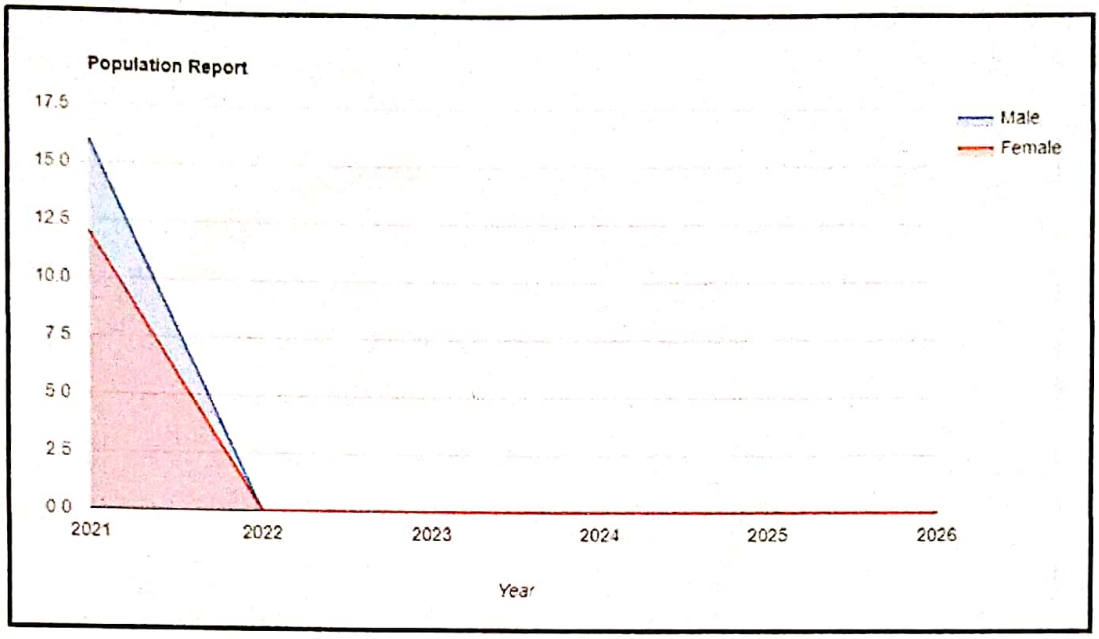
Republic of the Philippines
Region VII Central Visayas
Municipality of Bilar
Bilar, Bohol, Philippines 6317

Summary of Reports for the Population According to their Work Status (Year 2022)

Work Status	Male	Female	Total
Employed	16	7	23
Unemployed	16	12	28
Self-employed	1	2	3
Retiree	1	0	1

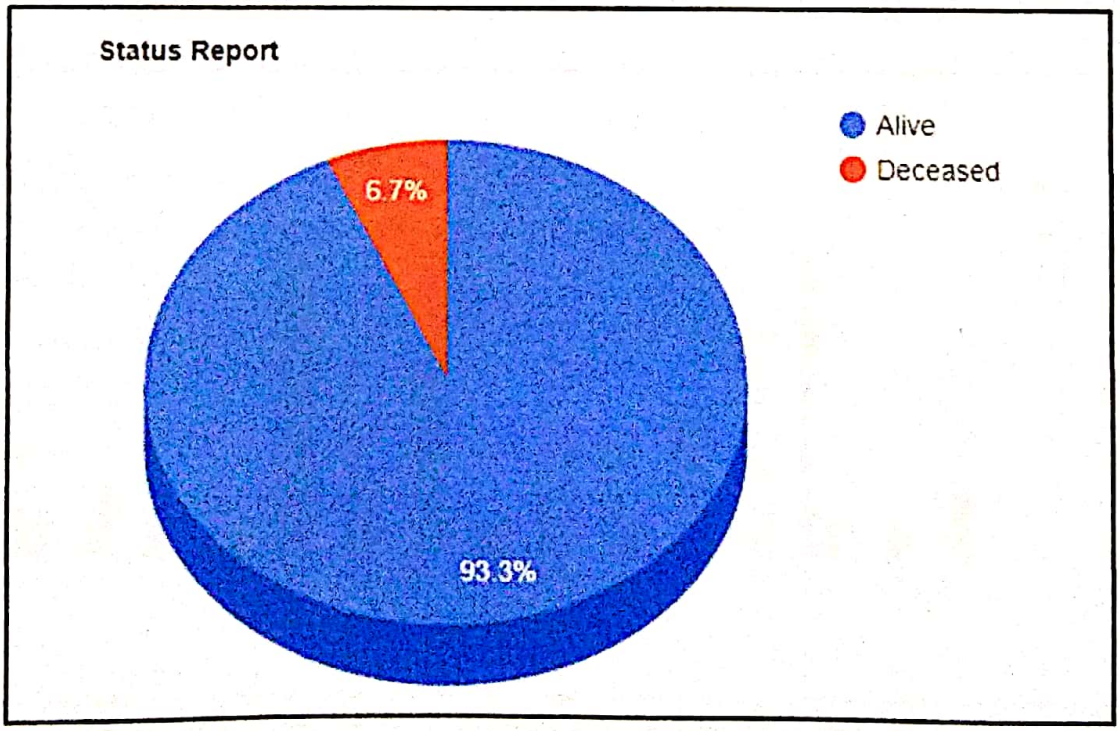
Preview 6. Population According to their Work Status

Preview 7 below shows the graphical report for Yearly Population Report.



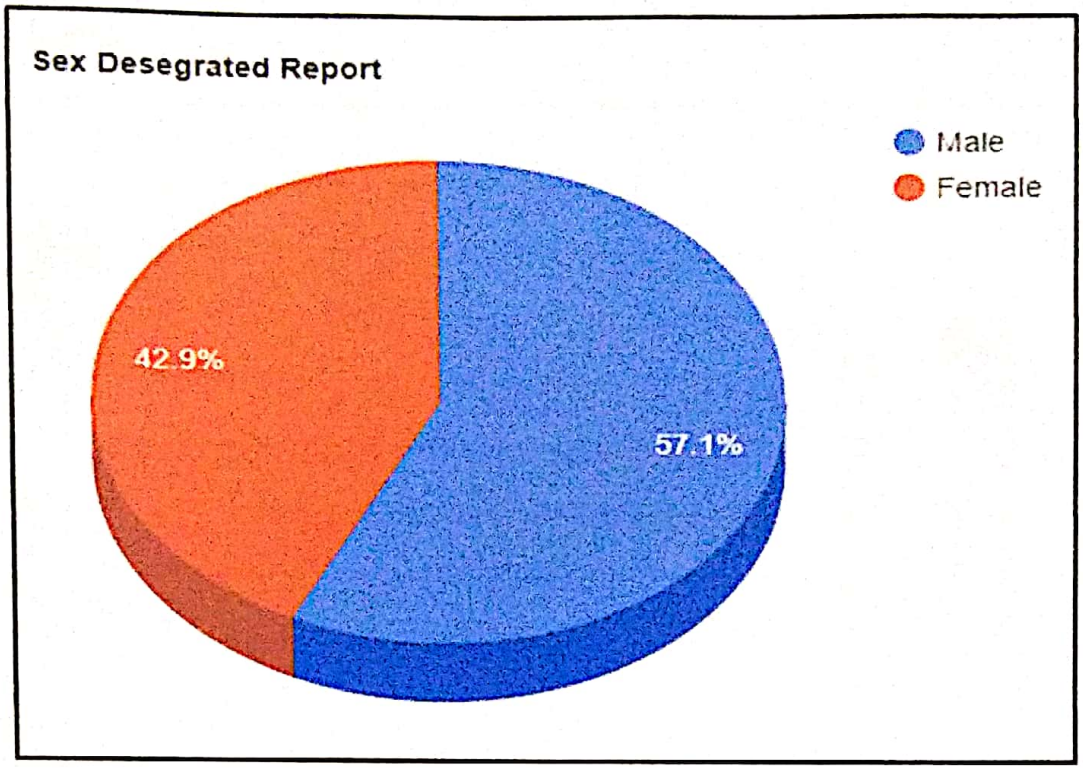
Preview 7. Yearly Population Report

Preview 8 below shows the graphical report for the Status Report of Alive and Deceased.



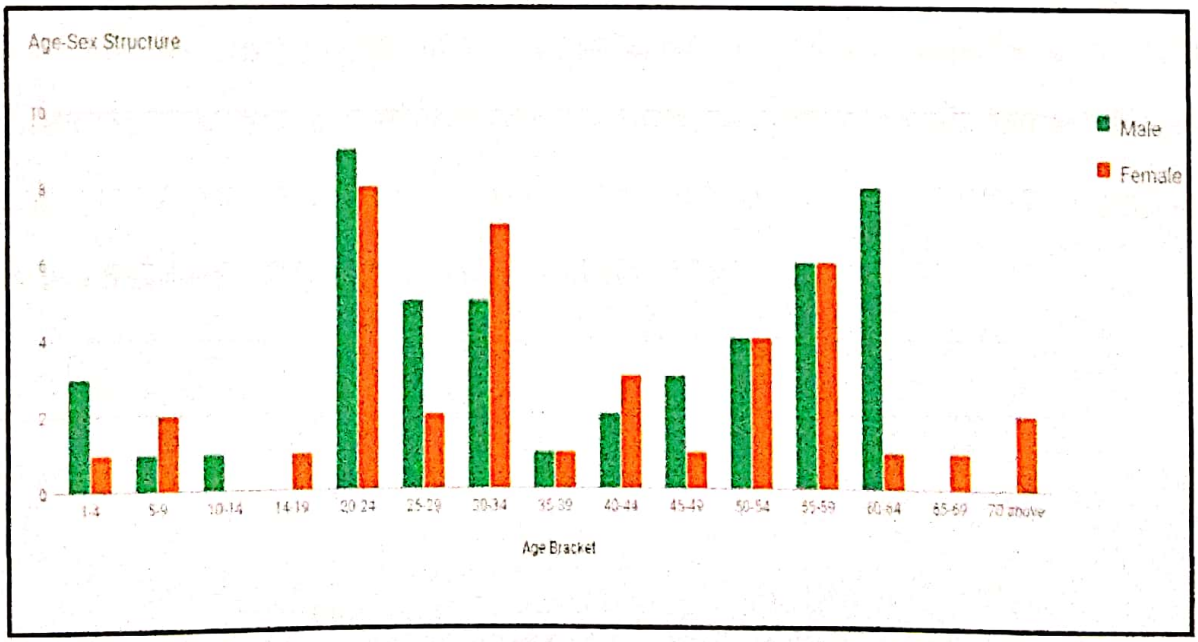
Preview 8. Status Report of Alive and Deceased

Preview 9 below shows the graphical report for Sex Desegregated.



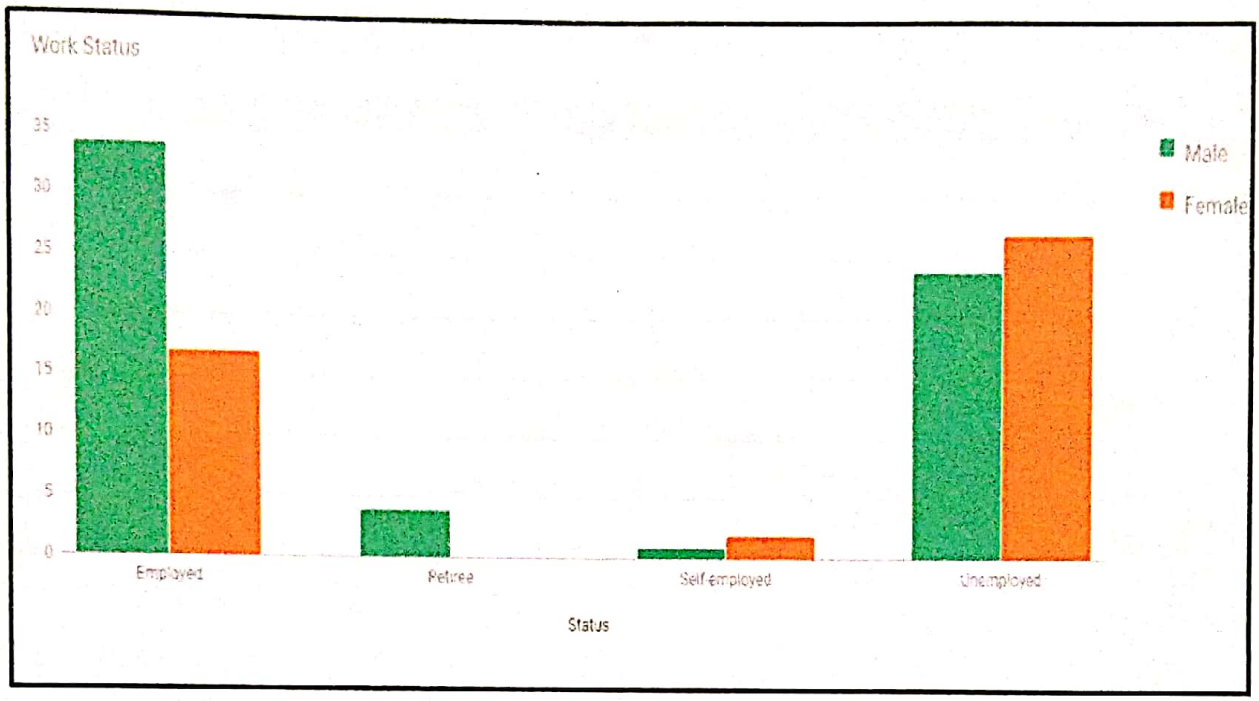
Preview 9. Population Sex Desegregated

Preview 10 below shows the graphical report for the Population Age Group by Sex.



Preview 10. Graphical Report for Population Age Group by Sex

Preview 11 below shows the graphical report for the Population According to their Work Status.

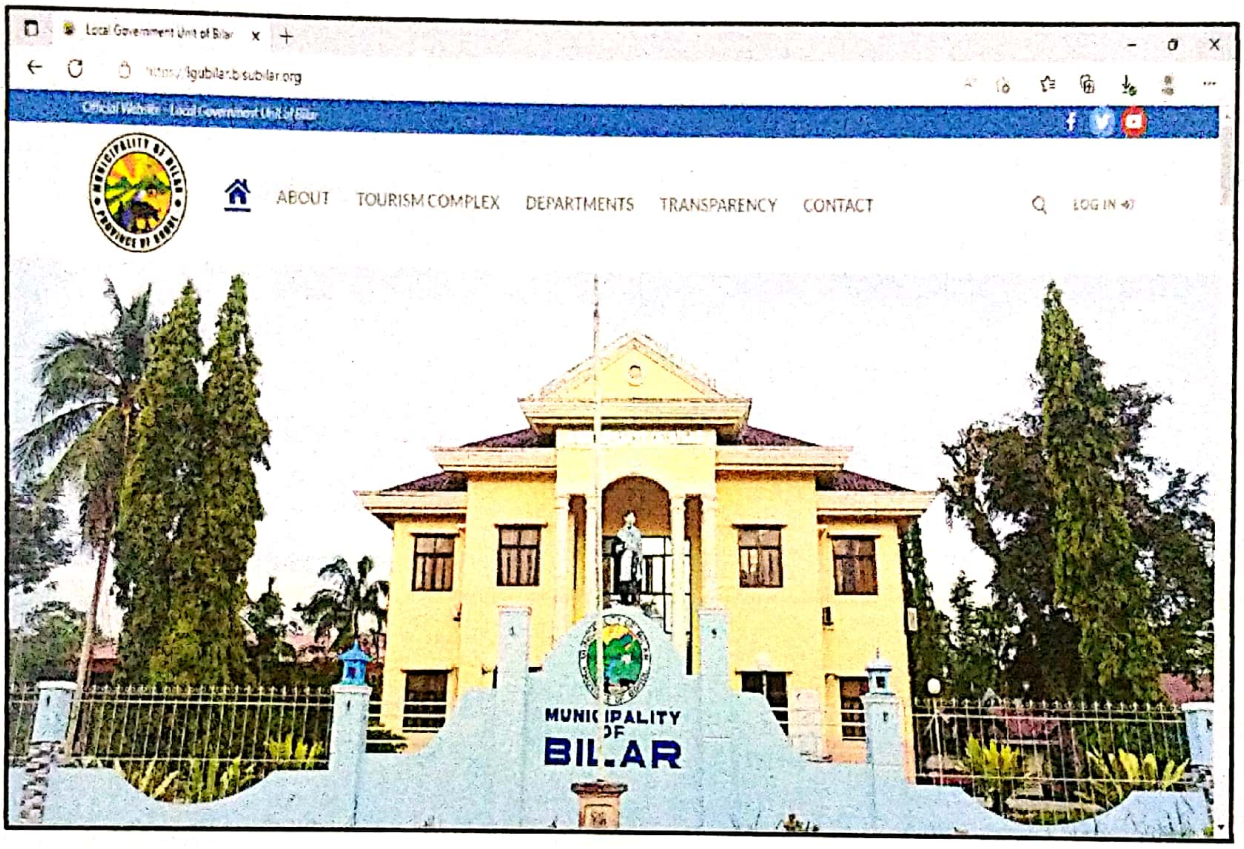


Preview 11. Graphical Report for Population According to their Work Status

Screen Layout

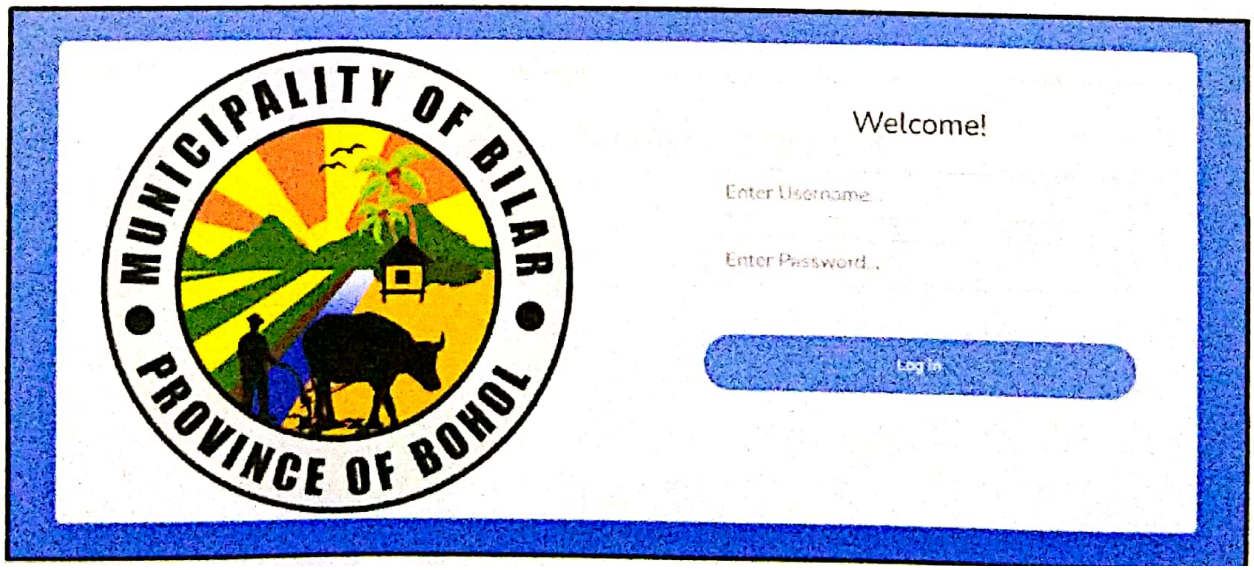
Screen layout is one of the system's user-friendliness features; it should be built in such a manner that users can traverse the system quickly and simply, and it should give a clear identification of the job that users must do. The graphics depict the created system's design and structure.

Preview 12 below shows the layout of the homepage of the Local Government Unit of Bilar website.

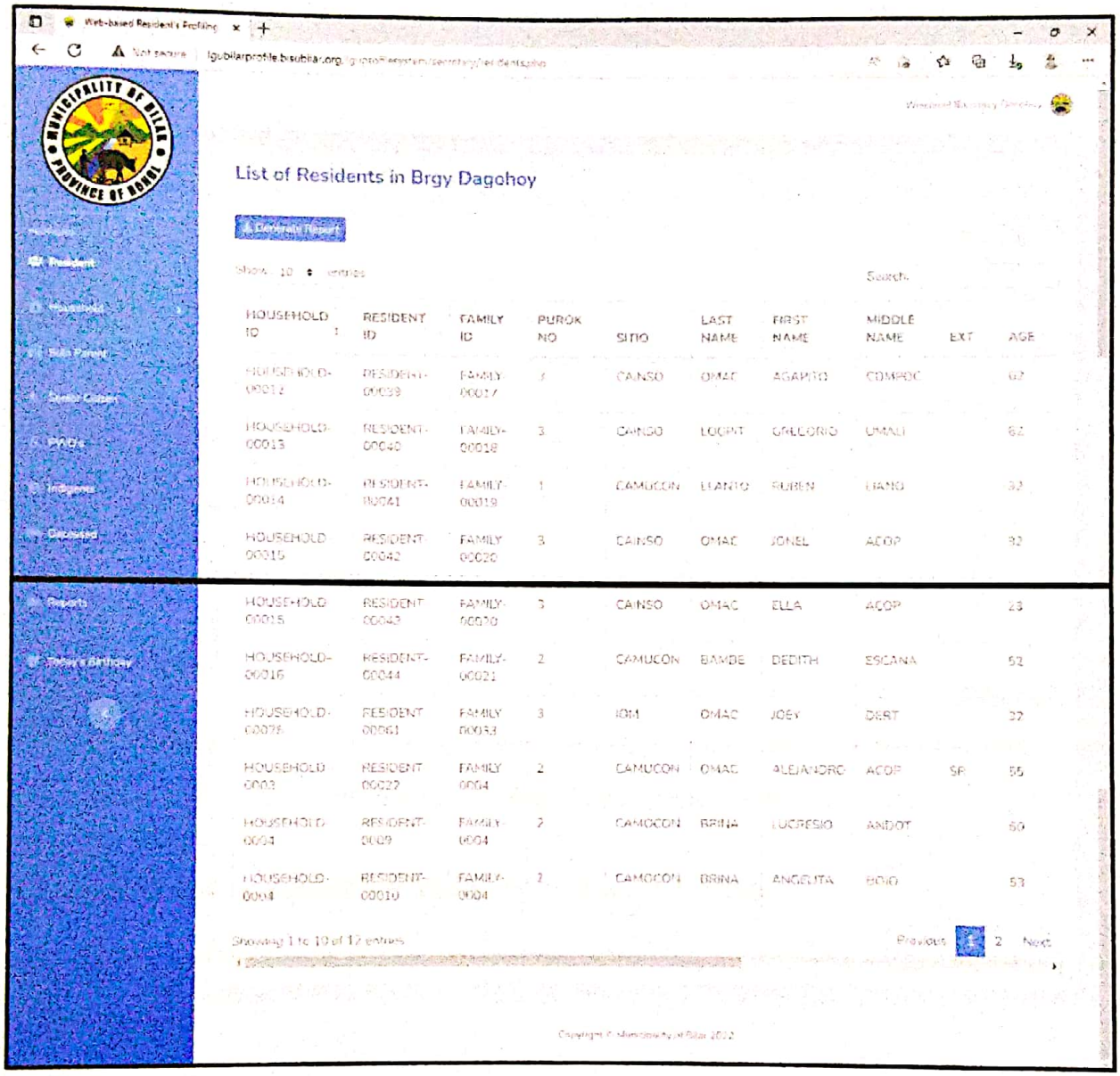


Preview 12. Homepage of the Local Government Unit of Bilar website.

Preview 13 below shows the Security Log-in of the system.

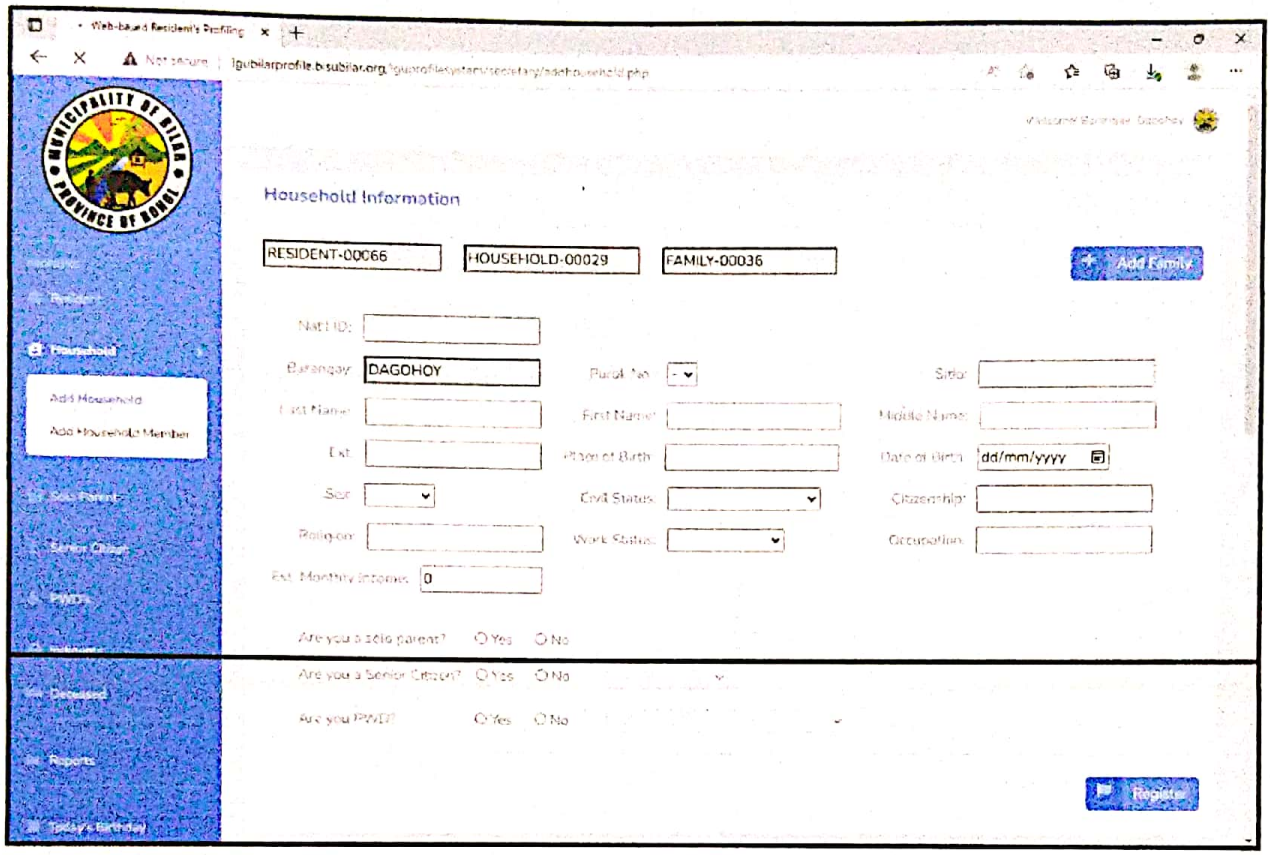


Preview 14 below shows Table List of the Residents.



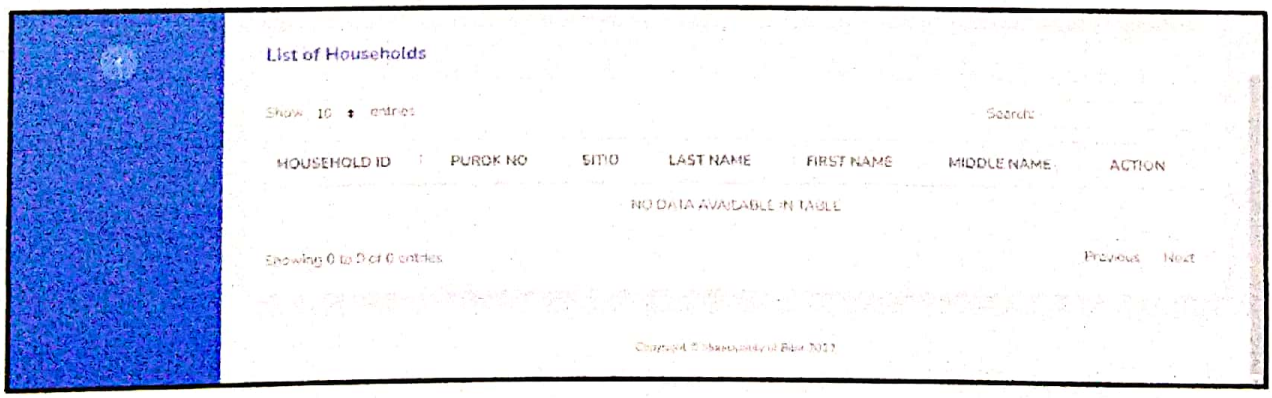
Preview 14. Residents' Table List

Preview 15 below shows the add household form.



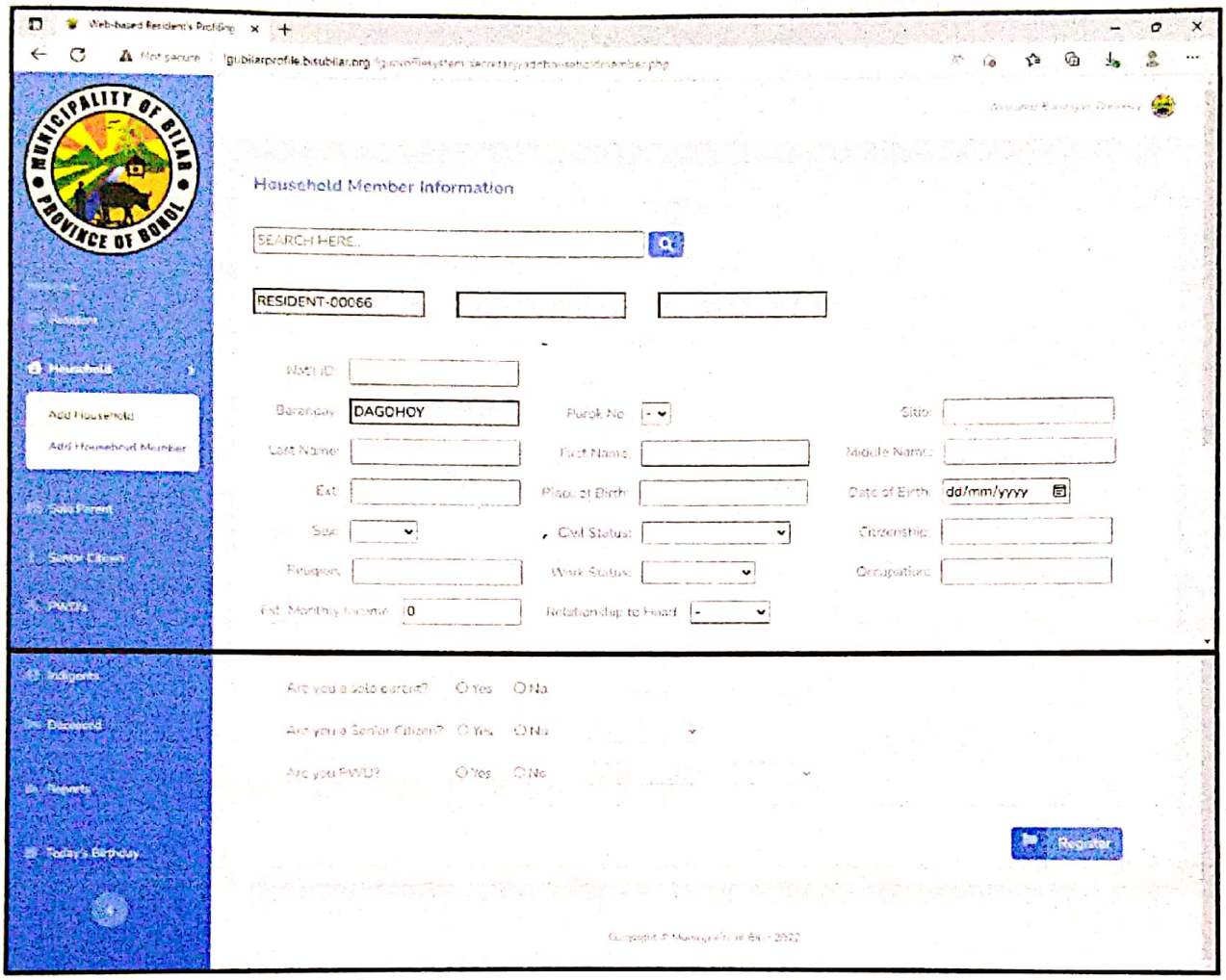
Preview 15. Add Household Form

Preview 16 below shows the Table list of the household.



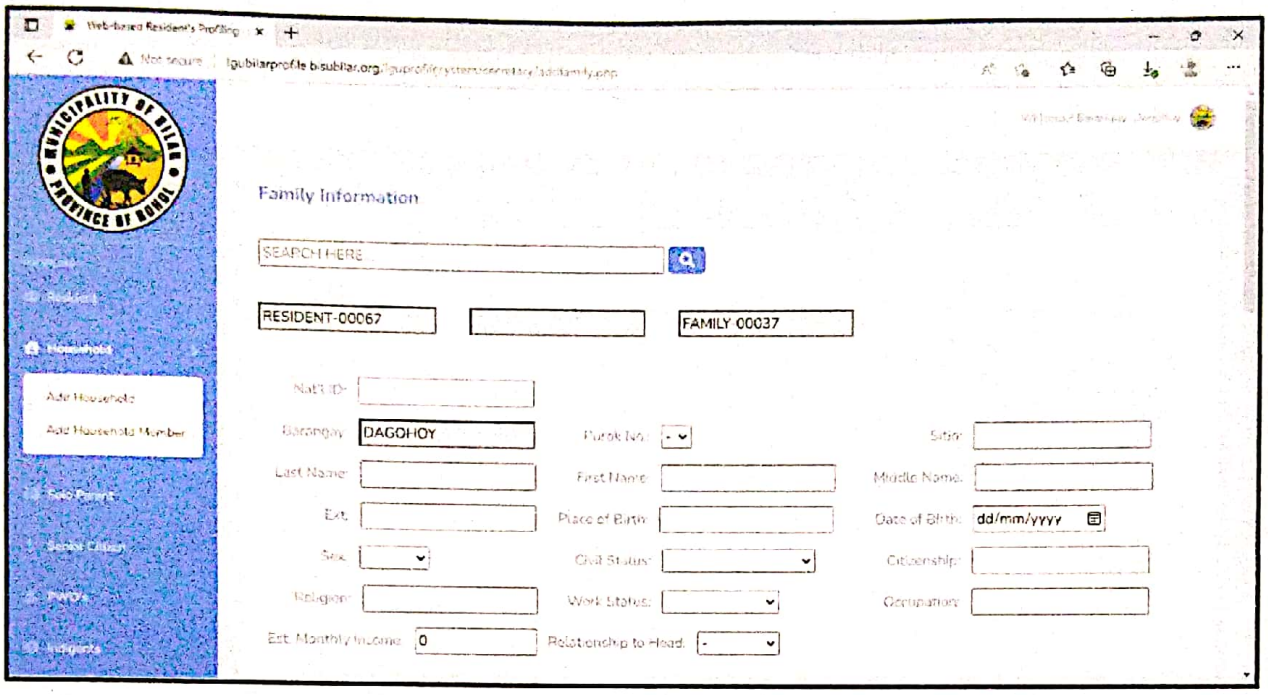
Preview 16. Household Table List

Preview 17 below shows the form to Add Household Member Form.



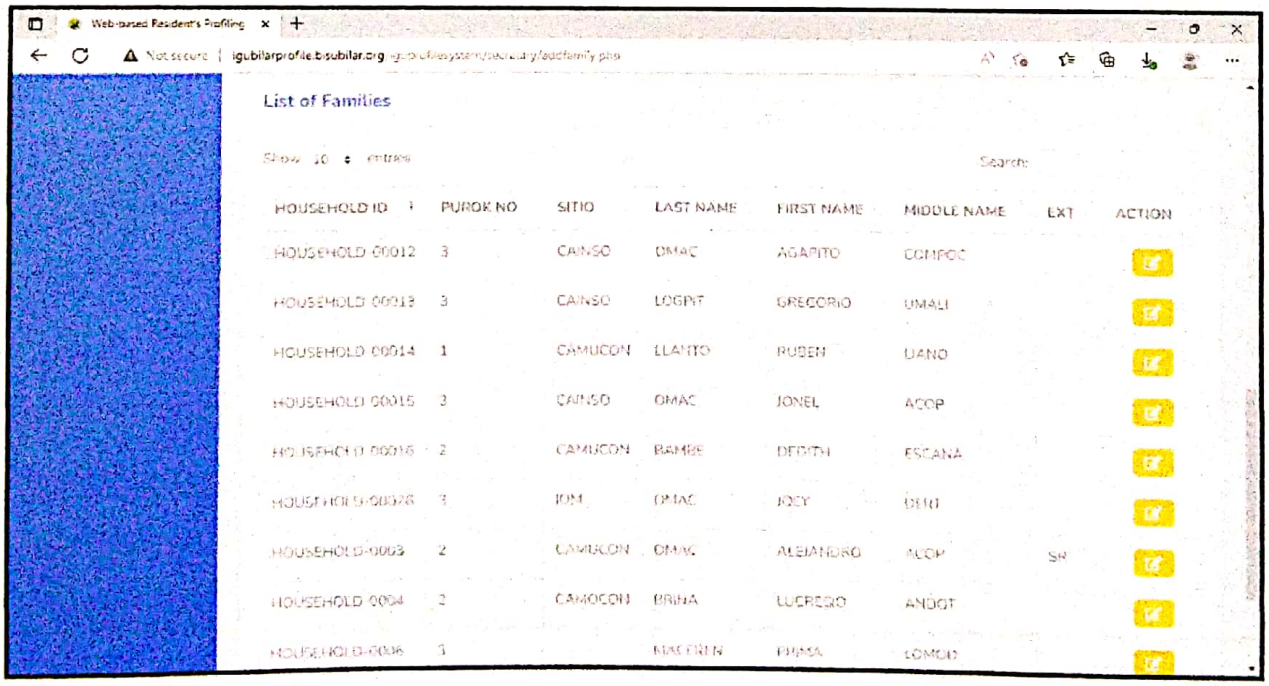
Preview 17. Add Household Member Form

Preview 18 below shows the form to add Family.



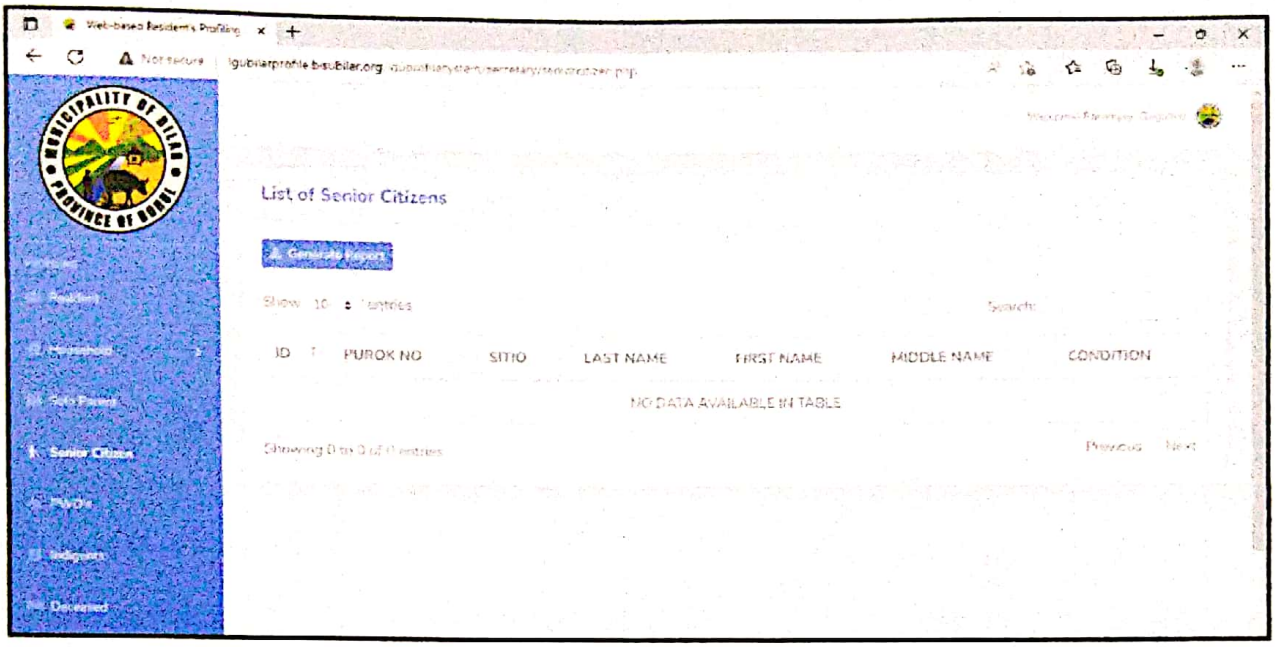
Preview 18. Add Family

Preview 19 below shows the table list of family.



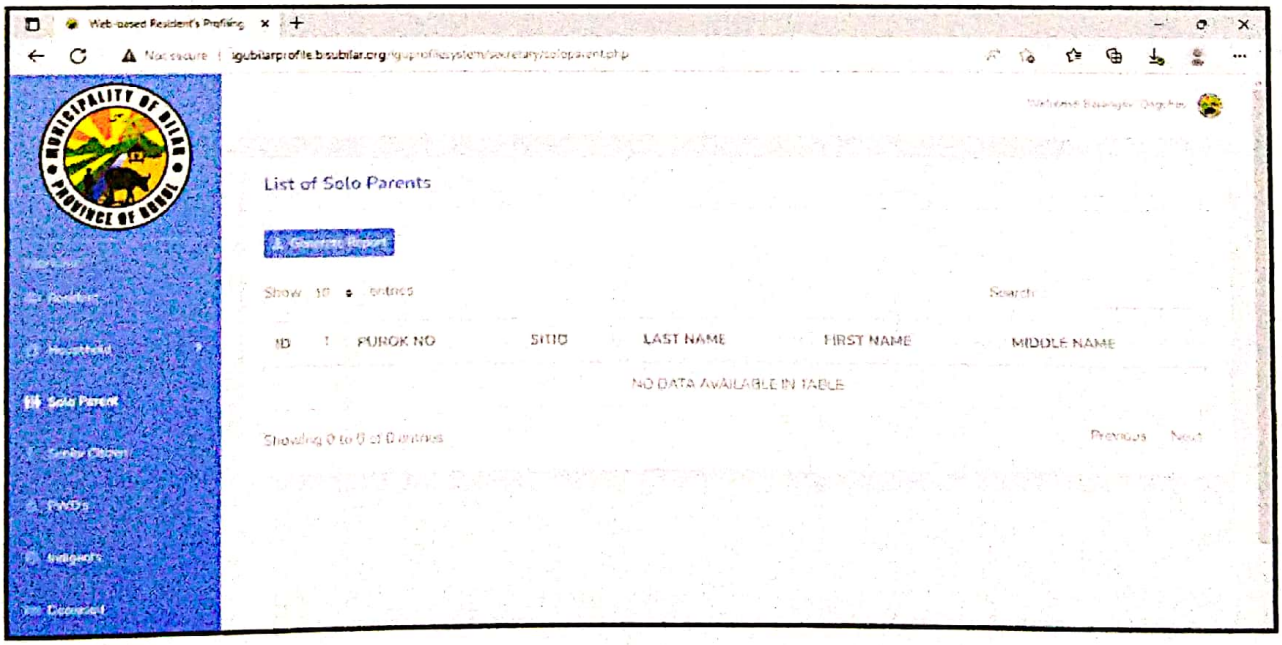
Preview 19. Table List of Family

Preview 20 below shows the Table List of Senior Citizen



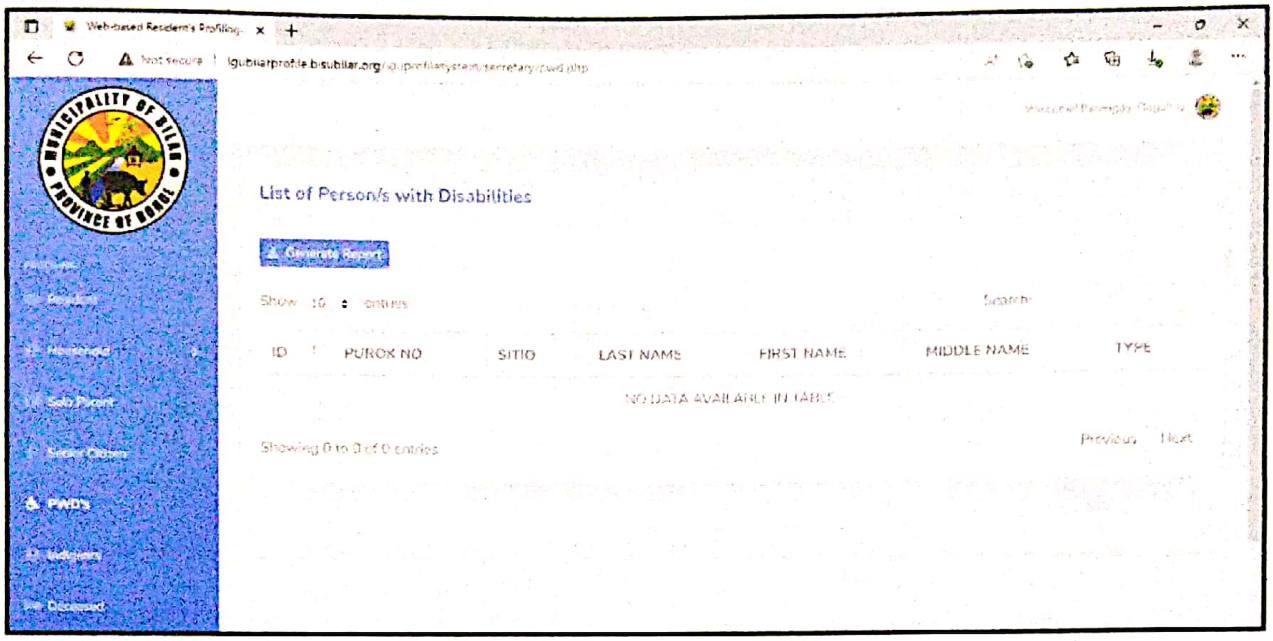
Preview 20. Senior Citizen Table List

Preview 21 below shows Table List of Solo Parent



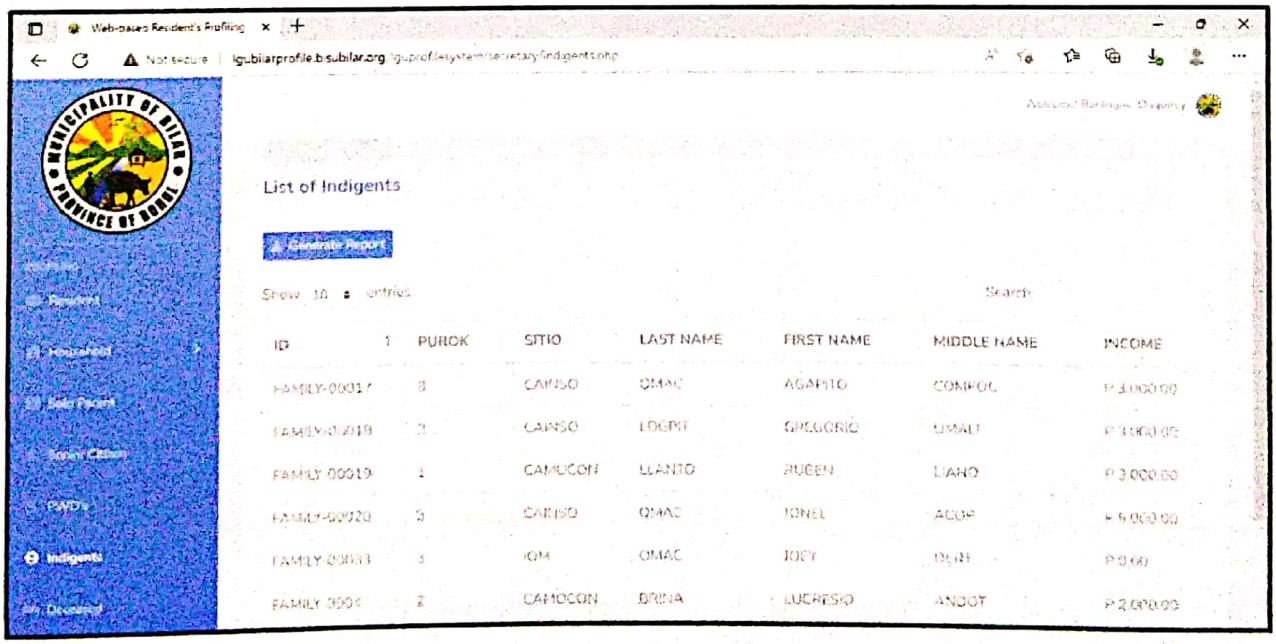
Preview 21. Table List of Solo Parent

Preview 22 below shows the Table List of Person with Disabilities



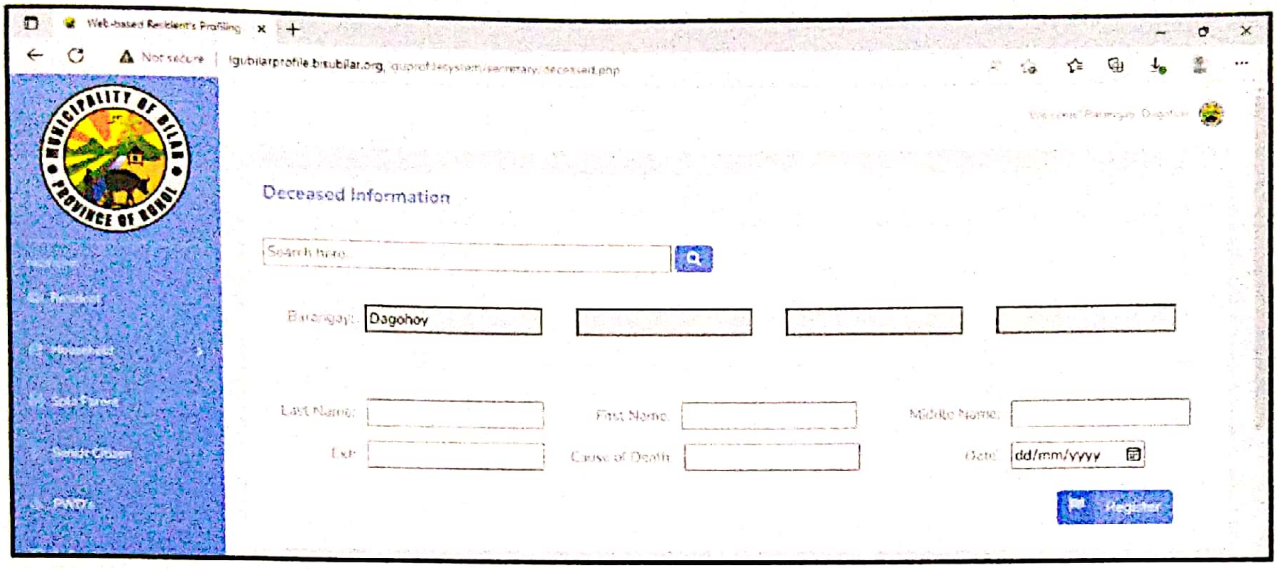
Preview 22. Table List of Person with Disabilities

Preview 23 below shows the Table List of Indigent



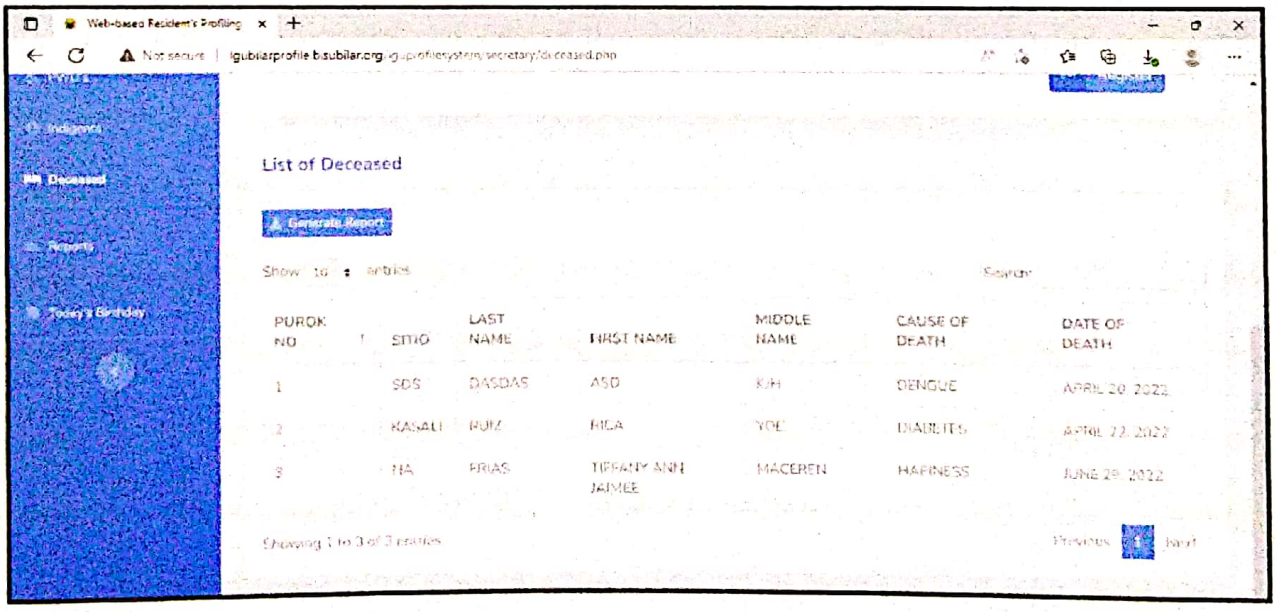
Preview 23. Table List of Indigent

Preview 24 below shows the form to add deceased



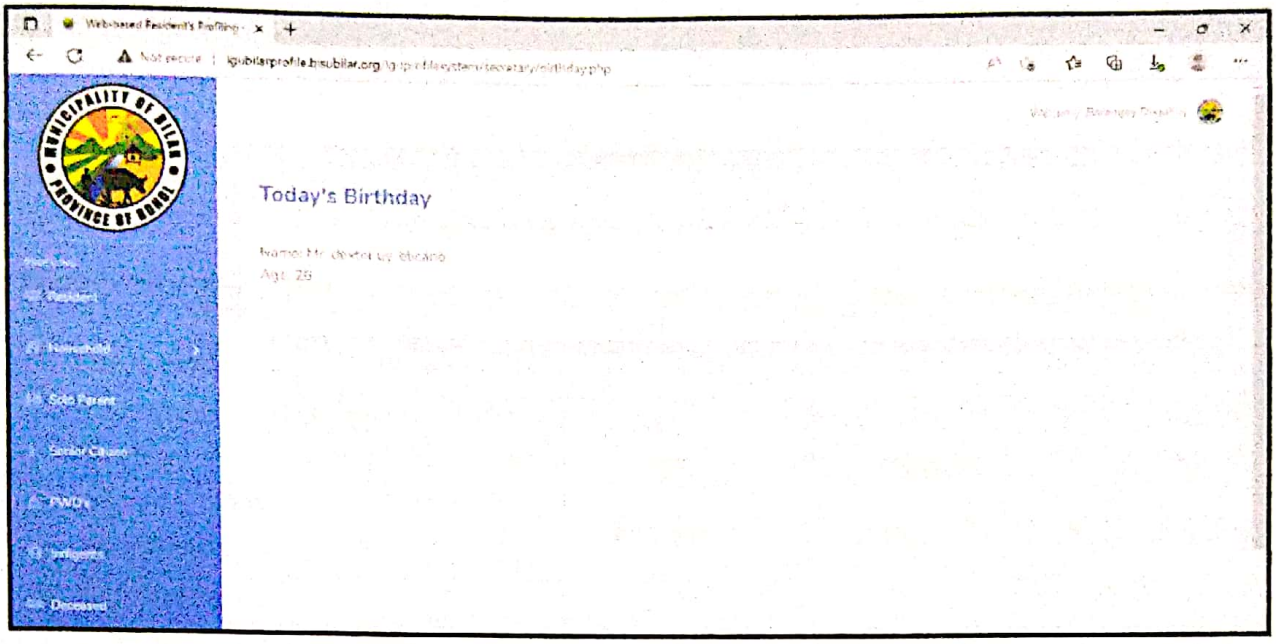
Preview 24. Add Deceased

Preview 25 below shows the table list Deceased



Preview 25. Table List of Deceased

Preview 26 below shows the List of Today's Birthday.



Preview 26. List of Birthdays

Economic Performance Evaluation

The economic performance of the Web-Based Residents' Profiling System was evaluated in terms of initial investment and annual operating cost. The initial investment is the amount required by the user prior to commencement of the operation and implementation of the system. On the other hand, the annual operating cost is the total amount required in one year of implementation. This includes the internet subscription cost, subscription for the domain and web hosting, office supplies, utilities, system maintenance and other related expenditures. Table below presents the required investment and annual operating cost in the adaptation of the system in Local Government Unit of Bilar and the 19 barangays of Bilar.

The list of amount provides an idea to the office whether to adopt the computerization or not.

Table 13

Initial Investment and Annual Operating Cost

Items	Qty.	Unit	Unit Price	Total
A. Hardware				
Computer Package	1	Set	₱ 15,000.00	₱ 15,000.00
Printer	1	Piece	₱ 7,500.00	₱ 7,500.00
Internet Service Provider	1	Piece	₱ 12,000.00	₱ 12,000.00
B. Software				
Software Development	1	Lot	₱ 10,000.00	₱ 10,000.00
		Subtotal Initial Investment Cost		**₱ 34,500.00**
C. Software				
Internet	12	Month	₱ 1,300.00	₱ 12,000.00
Domain and Web Hosting	1	Year	₱ 6,000.00	₱ 6,000.00
D. General Services				
System Maintenance	4	Quarter	₱ 1,500.00	₱ 6,000.00
		Subtotal Annual Operating Cost		**₱ 24,000.00**
		TOTAL		**₱ 58,500.00**

Testing Evaluation

Testing and assessment were carried out to verify the system's functioning, particularly in terms of providing desired output, time/period of information processing, amount of information processed, and correct reaction to user inputs. The testing was done to the eighteen (18) respondents composed of Barangay Secretary, DILG, MSWDO, MPDC, and IT Personnel.

System Usability

The system usability test was carried out to ascertain the level of system acceptance perceived by the target users. The system usability questionnaire was adopted from Lewis, (1995). The test was conducted at the Local Government Unit of Bilar on May 18-19, 20222. The developers visited the end users' offices to present the system and demonstrate modules in detail like record, manage, search, and display profile. The presentation and the answering of questions took two (2) days to complete. After every presentation, the respondents were requested to rate the system usability questionnaire.

According to the results, the average weighted mean of the system usability questionnaire is 6.57 with the interpretation of "Strongly Agree". The outcome typically implies that the system can be used to handle resident information. Specifically, the technology met the respondents' expectations in terms of function and capability. Furthermore, the material is clearly organized in the system; the content is highly extensive, with a nice user interface and convenience of use.

Table 14

System Usability Assessment Result

Criteria for System Usability	Weighted Mean	Rating
1. Overall, I am satisfied it with how easy it is to this system	6.6	Strongly Agree
2. It was simple to use this system	6.68	Strongly Agree
3. I can effectively complete my work using this system	6.52	Strongly Agree
4. I am able to complete my work quickly using this system	6.64	Strongly Agree

5. I feel comfortable using this system	6.52	Strongly Agree
6. It was easy to learn to use this system	6.56	Strongly Agree
7. I believe I became productive using this system	6.68	Strongly Agree
8. The system gives error messages that clearly tell me how to fix problem	6.44	Strongly Agree
9. Wherever I make mistake using this system, I recover easily and quickly	6.32	Agree
10. The information (such as online help, on-screen messages, and other documentation) provided with this system is clear	6.48	Strongly Agree
11. It is easy to find the information I needed	6.64	Strongly Agree
12. The information provided for the system is easy to understand	6.64	Strongly Agree
13. The information is effective in helping me complete the tasks and scenarios	6.56	Strongly Agree
14. The organization of information on the system screens is clear	6.72	Strongly Agree
15. The interface of this system is pleasant	6.64	Strongly Agree
16. I like using the interface of this system	6.64	Strongly Agree
17. This system has all functions and capabilities I expect it to have	6.36	Strongly Agree
18. Overall, I am satisfied with this system.	6.76	Strongly Agree
Average Weighted Mean	**6.57**	**Strongly Agree**

Web Usability

The program was demonstrated at the Local Government Unit of Bilar. The barangay secretary, DILG, MSWDO, MPDC, and IT Personnel rated the functionality, ease of use and the consistency of the program.

Based from the results, the average weighted mean of the web usability questionnaire is 4.54 with the interpretation of "Excellent". The outcome typically implies that the system can be used to handle resident information. This further means that the system provides an excellent control, and methods in the need of

the users to navigate and understand the system process. It is very consistent to errors and has good architecture and visual clarity.

Table 15

Web Usability Assessment Result

Criteria for Web Usability	Weighted Mean	Description
I. Navigation		
1.1 Current location within the site is shown Clearly	4.64	**Excellent**
1.2 Link to site's main page is clearly identified	4.56	**Excellent**
1.3 Major/important parts of the site are directly accessible from the main page	4.52	**Excellent**
1.4 Easy to use Search function is provided, as Needed	4.8	**Excellent**
1.5 Site accommodates novice to expert users	4.4	**Excellent**
	4.58	**Excellent**
II. Functionality		
2.1 Functions are clearly labeled	4.64	**Excellent**
2.2 Essential functions are available without leaving the site	4.52	**Excellent**
2.3 Plug-ins are used only if they add value	4.44	**Excellent**
	4.53	**Excellent**
III. User Control		
3.1 Site reflects user's workflow	4.88	**Excellent**
3.2 User can cancel any operation	4.6	**Excellent**
3.3 Clear exit point is provided on every page	4.68	**Excellent**
3.4 Per page loads moderately to accommodate slow connection	4.44	**Excellent**
3.5 Currently used browser is supported	4.8	**Excellent**
	4.68	**Excellent**
IV Language and Content		
4.1 Important information and task are given Prominence	4.56	**Excellent**
4.2 Information of low relevance or rarely used information is not included	4.4	**Excellent**
4.3 Related information or tasks are grouped: on the same page or menu or in the same area within a page	4.56	**Excellent**
4.4 Language is simple, without jargon	4.64	**Excellent**
4.5 Paragraph are brief	4.48	**Excellent**
4.6 Link are concise, expressive, and visible—		

not buried in text	4.28	Excellent
4.7 Terms are defined	4.28	Excellent
	4.45	**Excellent**
V. Online Help and User Guides		
5.1 It is always clear what is happening on the site – visual hints, etc.	4.92	Excellent
5.2 User can receive email feedback if necessary	4	Very Good
5.3 Confirmation screen is provided for form Submittal	4.48	Excellent
5.4 All system feedback is timely	4.48	Excellent
5.5 Users are informed if a plug-in or browser version is required	4.48	Excellent
5.6 Each page includes a "last updated" date	4.48	Excellent
	4.47	**Excellent**
VI. Consistency		
6.1 The same word or phrase is used consistently to describe an item	4.56	Excellent
6.2 Link reflects the title of the page to which it Refers	4.52	Excellent
6.3 Browser page title is meaningful and reflects main page heading	4.47	Excellent
	4.61	**Excellent**
VII Error Prevention and Correction		
7.1 User can rely on recognition, not memory, for successful use of the site	4.52	Excellent
7.2 Site tolerates a reasonable variety of user Actions	4.44	Excellent
7.3 Site provides concise instructions for user actions, including entry format	4.24	Excellent
7.4 Error message are visible, not hidden	4.64	Excellent
7.5 Error message are in plain language	4.68	Excellent
7.6 Error message describe action to remedy a Problem	4.6	Excellent
7.7 Error message provide a clear exit point	4.72	Excellent
	4.54	**Excellent**
VIII Architectural and Visual Clarity		
8.1 Site is organized from the user's perspective	4.64	Excellent
8.2 Site is easily scan able for organization and Meaning	4.68	Excellent
8.3 Site design and layout are redundant only when required for user productivity	4.56	Excellent
8.4 White space is sufficient; page is not too dense	4.44	Excellent
8.5 Unnecessary animation is avoided	4.56	Excellent

8.6 Colors used for visited and unvisited links are easily seen and understood	4.44	**Excellent**
8.7 Bold and italic text is used sparingly	4.16	**Very Good**
	4.49	**Excellent**
Average Weighted Mean	**4.54**	**Excellent**

Based from the Usability Guidelines developed by the MIT Information Services & Technology
Retrieve from http://ist.mit.edu/services/consulting/usability/guidelines

Chapter 3

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Summary of Findings

According to the results, the barangay secretaries use the semi-manual method in processing and recording the residents' profile. Furthermore, the Local Government Unit of Bilar has a large amount of data to combine, particularly in maintaining the barangay residents' profile. The barangay secretaries have the following problem in recording residents' profile (1) difficulty in handling and managing the residents' profile; (2) difficulty in the retrieval and consolidation of the residents' profile contributed to longer period of time in the generation of reports; and (3) the physical documents being prone to damage and loss since they are using paper documents or hard copies. With the problems identified, the developers intend to develop a system that would provide well-organized forms for data processing, recording, and managing of all the residents' profile of the Local Government Unit of Bilar. This work focuses on designing a system to improve the manual process used by the secretary of the different barangays in Bilar. The system is developed with the following features: (1) integration of an online mechanism to use a centralized server for all the barangays in Bilar; (2) design and implementation of the following modules: (a) Profiling, (b) Data Management, (c) Administration; (3) implementation of business intelligence techniques to assist the barangay and the municipality in making decisions

The developers interviewed and saw the barangay secretary and the Local Government Unit of Bilar, as well as reviewed papers on how they handle the method regarding on the residents' profile and reports. Following the design and development of the system, testing and assessment were carried out to determine the system's general acceptance. It was done to assess the efficacy of the established system. To test the system's functionality, the developers first present the system to users with the various modules and give them with the system handbook. Following the presentation, the users did individual hands-on with the system and the developers gave the web usability questionnaire to the users in order to measure the level of system and web usability.

According to the results in the system usability, the average weighted mean of the system usability questionnaire is 6.57 with the interpretation of "Strongly Agree". Furthermore, based from the results in the web usability, the average weighted mean of the web usability questionnaire is 4.54 with the interpretation of "Excellent". The outcome typically implies that the system can be used to handle resident information. Furthermore, the results imply that the respondents strongly agree and found excellence with its capabilities, functions, and ease of using the developed system.

Conclusions

Based on the findings, the developers found that the concerned department lacks a system for profiling of resident data and is still utilizing the manual method, which takes a significant amount of time in monitoring residents' profile and creating reports. The Web-Based Residents' Profiling System of Local

Government Unit of Bilar has improved in data retrieval and report generation. The system meets and exceeds the clients' expectations. In addition, adaption to the system needs minimum investment and incurs low operational costs, hence it is reasonable and economical.

Recommendations

Based on the results and observations made throughout the implementation, the developers strongly advise adopting the Web-Based Residents' Profiling System of the Local Government Unit in Bilar, Bohol for efficient management of residents' profile and recording, and for future development. The following are particularly recommended.

1. An official launching of the website for the awareness of the public about the availability of the Web-Based Residents' Profiling System of Local Government Unit of Bilar shall be made.
2. There should be an orientation for the barangay secretary, DILG office personnel, MSWDO office personnel, and MPDC office personnel to become acquainted with the system's functioning and usage. IT Personnel should be a regular office worker in order to effectively maintain the website.
3. The Local Government Unit of Bilar should provide a hosting services in order to officially launch the website and the system. There must be a secure and reliable internet connection to avoid lag time when using the system. To ensure the system's security, stability, and integrity, it should be maintained on a regular basis and flaws should be checked.

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