

# **Data Collection System for Census**

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**An Object Oriented Programming Project**

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## **I. Background of the Study**

Across many rural communities, manual collection of personal data of individuals are still widely used. These approaches are time-consuming, prone to errors, result in the collection of incorrect or mismatched information about individuals, and often lack real-time data.

In regards to these issues, the team developed a system that will help personnel that are assigned in collecting data for a census survey to have an easier way of collecting information from individuals. The system helps in collecting, saving, accessing, validating, updating information, which are saved in a database for efficient data manipulating.

While several census collection system exist, and some might have better functions than ours, our system leverages on simplicity without unnecessary complexity for easy use and efficient data handling.

## **I. Objectives**

The main objective of this study is to develop a robust and effective data collection system for census purposes. This system will operate entirely offline for data entry, ensuring accessibility in areas without internet connectivity. Simultaneously, it will offer online functionalities for administrators, including account creation, user management, data aggregation, and analysis.

With this study our system will have enhanced data gathering process, improve data accuracy and accelerate data analysis. The system will be designed and developed as a user-friendly to ensure the best performance and user experience. And will undergo thorough testing to guarantee its performance and dependability. Strong security measures will also be implemented to protect sensitive census data.

## II. Scope and Delimitation of the Study

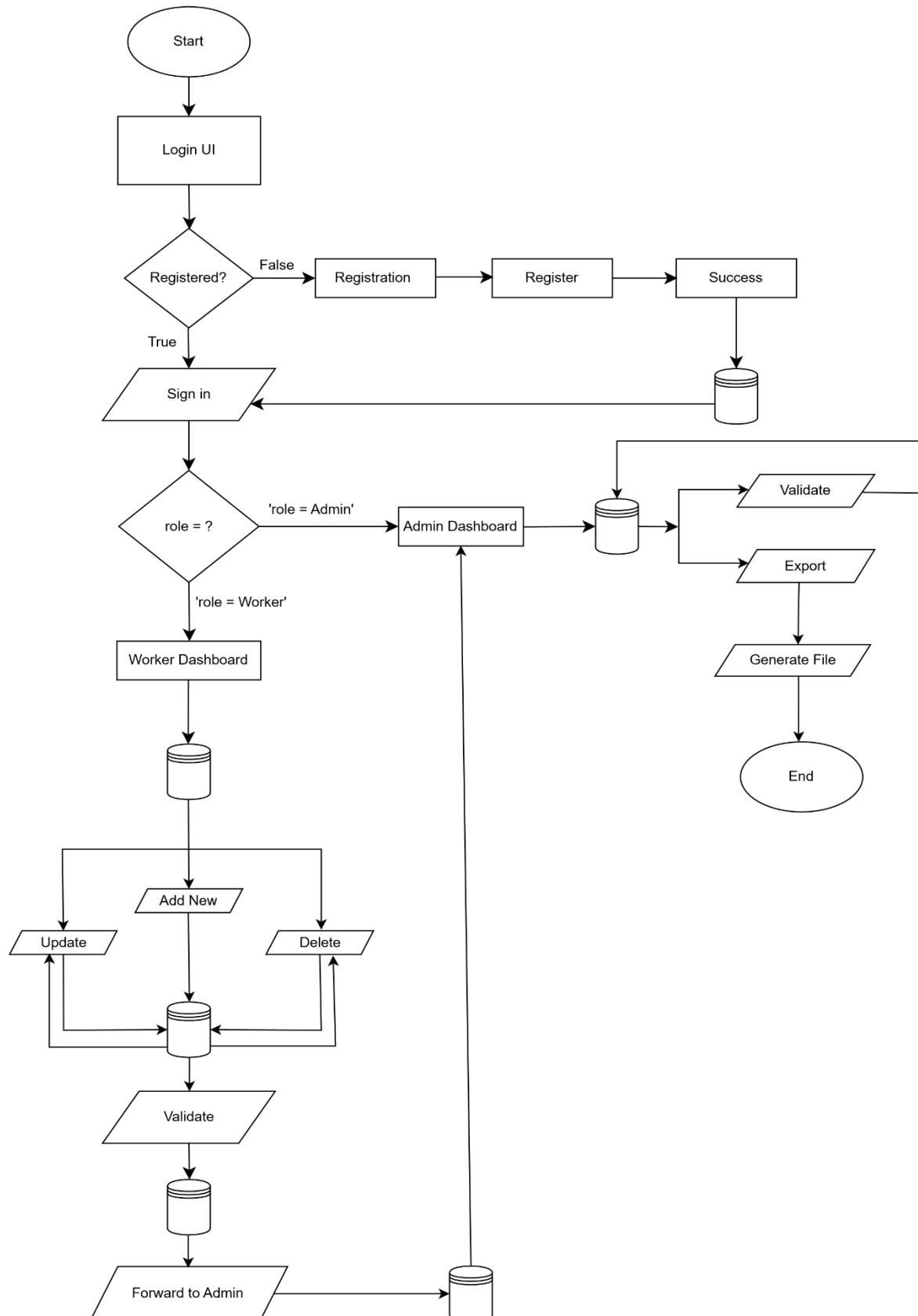
### Scope:

- The system will be designed to serve the needs of government workers, particularly census workers and field agents.
- Collect demographic, socioeconomic, and housing data in areas with limited or no internet connectivity.
- Validates data input to ensure accuracy and consistency.
- Securely store and manage collected data.
- Provide a simple and intuitive interface for field enumerators to input data.
- Allow administrators to manage user accounts and access data remotely.

### Delimitations:

- The study is limited to the development and implementation of a data collection system for a specific region.
- The system will focus on core functionalities and may not incorporate advanced features or data analysis methods.
- The constrained project timeline affects the system's full potential and comprehensive feature set.
- The team's narrow experience and knowledge constrains the system's complexity and functionality
- Limited access to sufficient hardware and software resources hinders the system's development and testing.

#### IV. Flowchart



## **Flowchart Narrative Description:**

The flowchart depicts the simple yet operational flow of Data Collection System for Census, highlighting the interactions between users, their roles, and the system's database. The following is a detailed narrative explaining each step and process that happens inside the system:

### **Start:**

The process begins with the system initialization, where the user is directed to the Login UI.

### **Login UI:**

At this interface, the user either logs in or proceeds to registration if they do not have an account.

### **Registration Check:**

Decision Point: The system checks whether the user is already registered:

if False: The user proceeds to the Registration process.

if True: The user is redirected to the Sign In process.

### **if not Registered:**

New users input their details to create an account. Upon successful registration, their information is stored in the database, and they are notified of their success.

### **if Registered: Sign In**

Registered users log in by providing their credentials. The system verifies these credentials against the database.

### **Role Identification:**

Decision Point: After logging in, the system identifies the user's role:

if Role = Admin: Redirected to the Admin Dashboard.

if Role = Worker: Redirected to the Worker Dashboard.

## CLAVERIA

### Admin Dashboard:

Administrators have access to manage workers and perform higher-level system operations:

Central Database: Admin holds all collected data handed to them by the workers

Handle Data: Admin can only check if data are validated by the workers, and can either export or delete those data.

Export: Admins can generate files for reporting or external use.

### Worker Dashboard:

Workers have access to manage their records and perform specific actions:

Add New: Workers can create new entries.

Update: Existing records can be modified.

Delete: Records can be removed as necessary.

These operations are stored in the database and can later be validated.

### Validation:

After the worker is done in either adding or updating an existing entry, they can validate the data to further improve handling and makes the entries more secured.

### Forward to Admin:

Workers' can choose to forward all validated data to the Admin for final review and approval.

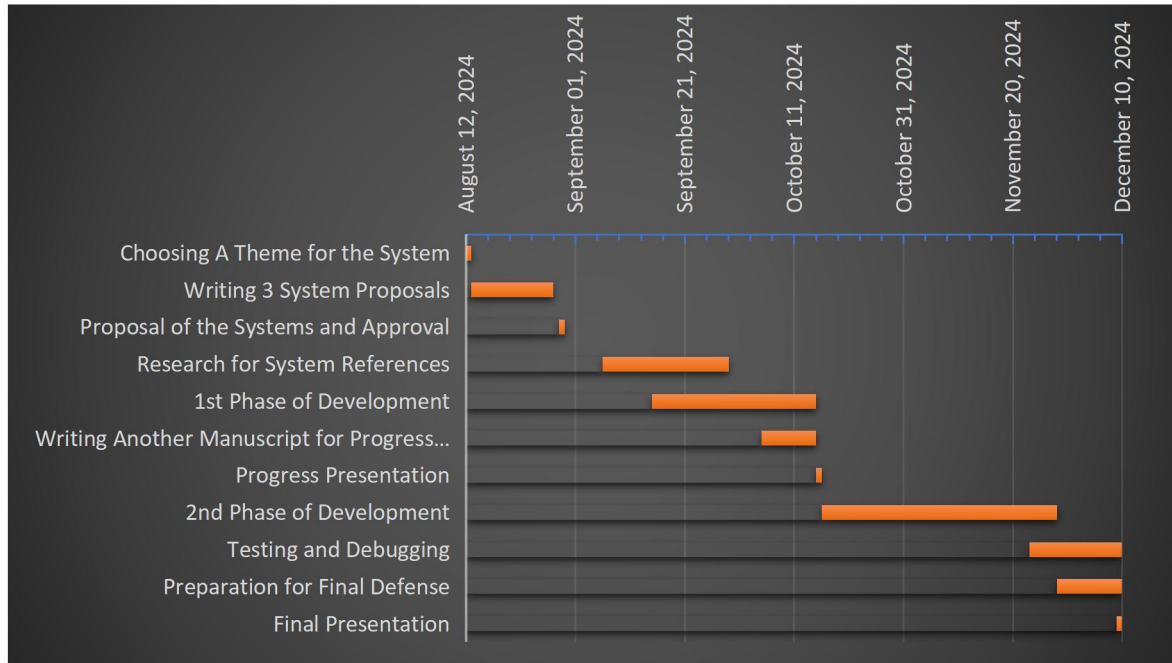
### End:

The process concludes with the generation of files or finalization of tasks.

### Summary:

This simple flowchart represents the basic flow of the system, efficiently dividing functionalities based on roles (Admin and Worker). It ensures data security through validations and allows for dynamic management, such as adding, updating, and deleting records. Each process is streamlined to maintain order and accountability.

## V. Gantt Chart



### Description:

- **August 12, 2024 – August 13, 2024:** Designated for choosing a theme for our system.
- **August 13, 2024 – August 28, 2024:** Writing three system proposals, outlining possible solutions and approaches for the project.
- **August 29, 2024:** Presentation and approval of the proposed systems.
- **September 6, 2024 – September 29, 2024:** Conducting research to gather references and resources for the system's development.
- **September 15, 2024 – October 15, 2024:** The first phase of development, with a primary focus on designing and developing the user interface (UI) to ensure a user-friendly and visually appealing.
- **October 05, 2024 – October 15, 2024:** Writing a manuscript about the progress to prepare for the upcoming progress presentation.
- **October 15, 2024:** The progress presentation, showcasing the work done during the first phase of development.

- **October 16, 2024 – November 28, 2024:** The second phase of development, focusing on adding features and refining the system. Improving backend logic and finalizing the overall flow of the system.
- **November 23, 2024 – December 09, 2024:** Performing testing and debugging to identify and fix issues, ensuring the system operates as intended.
- **November 28, 2024 – December 10, 2024:** Preparing for the final defense, including presentation materials and final touches on the system.
- **December 10, 2024:** Final presentation, showcasing the completed system.



## VI. System Design



The screenshot shows a login window titled "DATA COLLECTION SYSTEM FOR CENSUS". On the right side, there is a white panel titled "LOGIN HERE BUDDY". Inside this panel, there are input fields for "username" (containing "rexy") and "password" (containing "rex"). Below the password field is a checkbox labeled "show password" which is checked. At the bottom of the panel is a "sign in" button. Below the white panel, there is a link "Don't have an account?" followed by a "sign up" button. A green close button is in the top right corner of the window.

### Main Login and Title of the System:

On the left side is the name of the system which is "Data Collection for Census".

### Main Login Panel:

Located in the right side of the window, a small white panel can be seen where the user can enter their credentials to log in.

### Contains fields for:

**username:** To input the user's username.

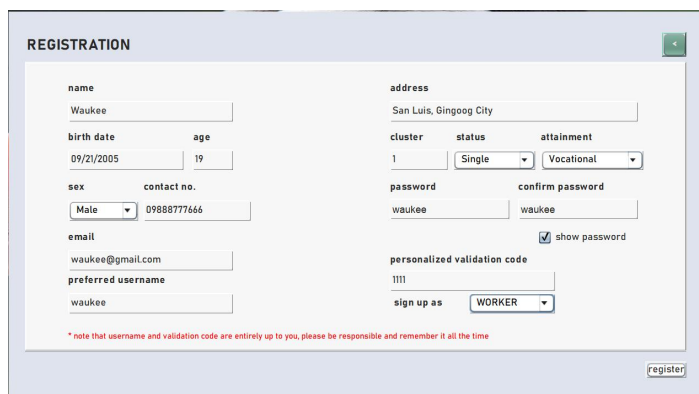
**password:** To input the user's password.

A **"show password" checkbox**, which allows the user to toggle the visibility of the password.

A **"sign in" button** for submitting credentials to authenticate the admin.

A **"sign up" button** that redirects the user to the registration window for if the user is new and wants to register.

A green button on the upper right side is always present on every window that functions as a back button that goes back to the previous window.



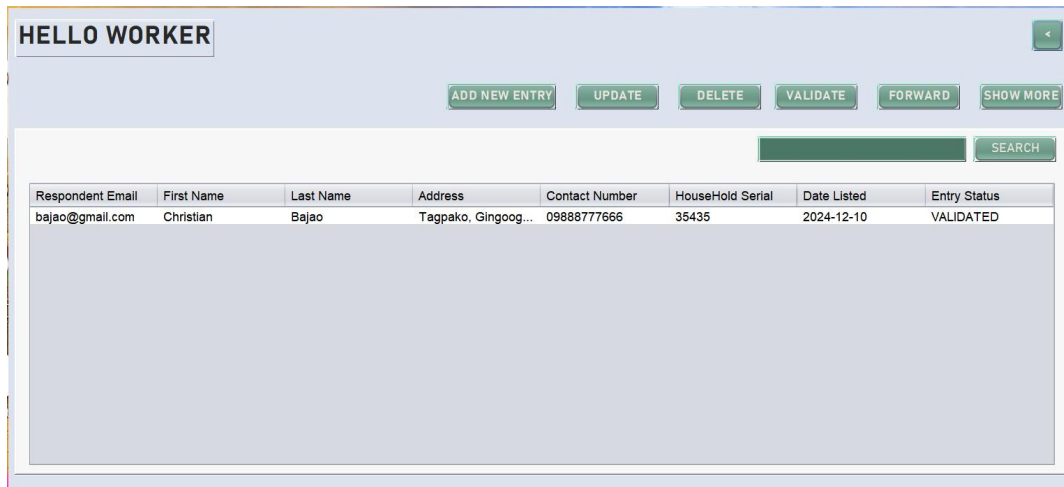
The screenshot shows a registration window titled "REGISTRATION". It contains several input fields: "name" (Waukee), "address" (San Luis, Gingoog City), "birth date" (09/21/2005), "age" (19), "sex" (Male), "contact no." (09888777666), "email" (waukee@gmail.com), "preferred username" (waukee), "cluster" (1), "status" (Single), "attainment" (Vocational), "password" (waukee), "confirm password" (waukee), and "personalized validation code" (1111). There is a "show password" checkbox checked. At the bottom, there is a "sign up as" dropdown menu set to "WORKER" and a "register" button. A small red note at the bottom states: "\* note that username and validation code are entirely up to you, please be responsible and remember it all the time". A green close button is in the top right corner.

### Registration Window:

Contains fields where the user can put essential information needed for signing up and registering into the system.

A **"register"** button is on the lower right side of the window

where the user can click to finish their registration after they input the needed data.



The screenshot shows a web interface titled "HELLO WORKER". At the top right is a back arrow button. Below the title are several action buttons: "ADD NEW ENTRY", "UPDATE", "DELETE", "VALIDATE", "FORWARD", and "SHOW MORE". Below these buttons is a search bar with a "SEARCH" button. The main content area contains a table with the following data:

Respondent Email	First Name	Last Name	Address	Contact Number	HouseHold Serial	Date Listed	Entry Status
bajao@gmail.com	Christian	Bajao	Tagpako, Gingoog...	09888777666	35435	2024-12-10	VALIDATED

## Worker Dashboard:

### Contains:

A responsive **"HELLO WORKER"** label, that will show the details of the worker if clicked.

A **table** the shows all the existing data collected by the worker.

### Buttons:

**"ADD NEW ENTRY"**: opens a window for adding a new data entry from respondents.

**"UPDATE"**: works only if the worker first selects a row of data to be edited and the opens a new window where the worker can edit information about the respondent.

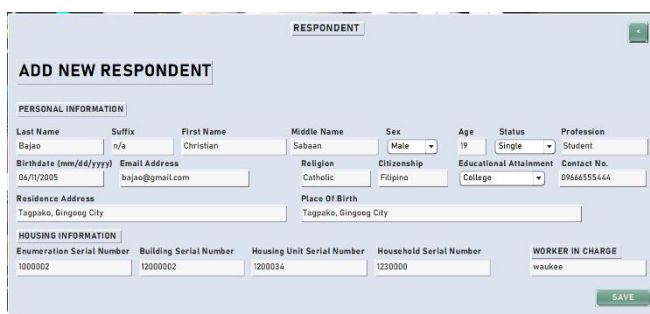
**"DELETE"**: works only if the worker first selects row/rows of data to be deleted and the opens a new small window where the worker can delete information about the chosen respondents.

**"VALIDATE"**: works only if some or all data is not yet validated by the worker and the opens a new small window where the worker has to enter their validation code to validate all the data in one go.

**"FORWARD"**: forwards all 'validated' data to the admin, and filters them if an entry was already forwarded to the admin, then it shall not be included.

**"SHOW MORE"**: works only if the worker first selects row a of data in the table and it then opens a small window where the user can see other details of the respondent.

**"SEARCH BUTTON AND BAR"**: let's the worker search for an entry they want in the table.

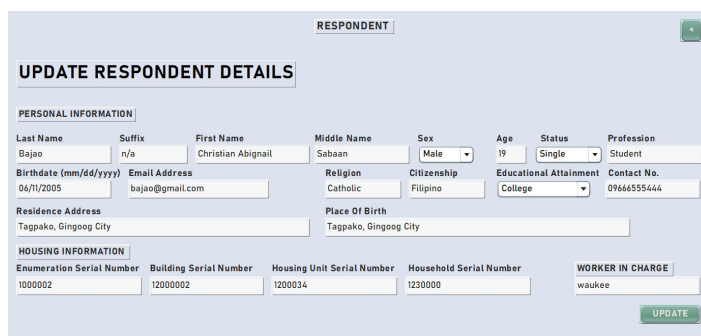


## Window for Adding a New

### Respondent:

Can be accessed by clicking the “ADD NEW ENTRY” button in the **WORKER DASHBOARD**. Helps the worker add a new respondent.

Text fields are present that lets the worker input necessary data of the respondents, and by clicking the “SAVE” button in the lower right of the window, all data will be saved in the database and displayed in the table in the **WORKER DASHBOARD**.

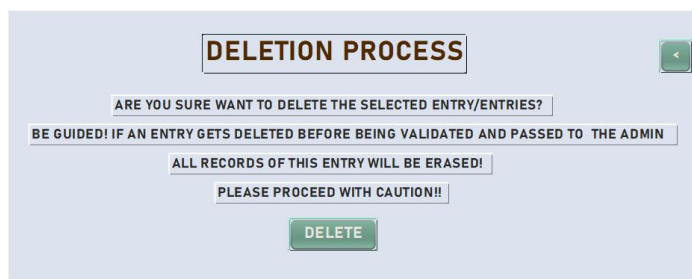


## Window For Updating Existing Records About the Respondent:

Can be accessed by selecting a row in the table and by clicking the “UPDATE” button in the **WORKER DASHBOARD**.

It lets the worker edit existing record about the chosen respondent.

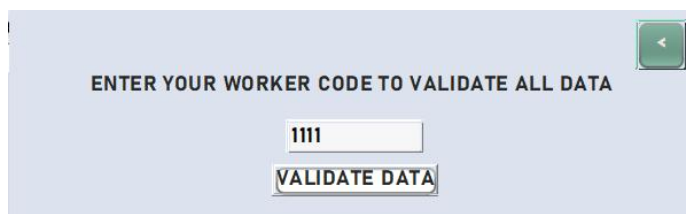
Dynamic text fields are present that lets the worker edit necessary data of the respondents, and by clicking the “UPDATE” button in the lower right of the window, all data will be updated and saved in the database and displayed in the table in the **WORKER DASHBOARD**.



## Window For the Delete Process:

Can be accessed by selecting row/rows in the table and by clicking the “DELETE” button in the **WORKER DASHBOARD**.

Prompts the worker if they want to delete all selected data, and by clicking the “DELETE” button on the bottom of the window, the process is done.



## Window For the Validation Process:

Can be accessed by clicking the **“VALIDATE”** button in the **WORKER DASHBOARD**. Prompts the worker to input their validation code, and by clicking the **“VALIDATE DATA”** button on the bottom of the window, the program checks if validation matches and if it does, it then checks if there are entries that are not yet validated and then validates all of them in one go.



**NAME CHECK !**

ENTER YOUR USERNAME HERE TO LET THE ADMIN KNOW WHO YOU ARE

**FORWARD DATA TO ADMIN**

## Window For the Forward Process:

Can be accessed by clicking the **“FORWARD”** button in the **WORKER DASHBOARD**.

Prompts the worker to input their username, and by clicking the **“FORWARD DATA TO ADMIN”** button on the bottom of the window, the program checks if username matches with record of the worker and if it does, it then checks if there are entries that are validated and then forwards all of them to the admin in one go but, if an entry has already been forwarded to the admin, it would not be included in the current process.



**RESPONDENT DETAILS**

**PERSONAL INFORMATION**

Last Name Bajao	First Name Christian	Middle Name Sabaan	Suffix n/a
Birthdate (mm/dd/yyyy) 06/11/2005	Place Of Birth Tagpako, Gingoog City	Age 19	Sex Male
Residence Address Tagpako, Gingoog City	Citizenship Filipino	Status Single	
Email Address bajao@gmail.com	Contact No. 09666555444	Profession Student	Religion Catholic
Educational Attainment College	WORKER IN CHARGE waukee	ENTRY STATUS NOT YET VALIDATED	

**HOUSING INFORMATION**

Enumeration Serial Number 1000002	Building Serial Number 1200002	Date Listed 2024-12-10 00:45:45
Household Serial Number 1230000	Housing Unit Serial Number 1200034	

## Window For Showing More Info About the Respondent:

Can be accessed by selecting a row in the table and by clicking the **“SHOW MORE”** button in the **WORKER DASHBOARD**.

It displays all of the data that matches in the database based on the selected entry in the table.



**WORKER DETAILS**

**PERSONAL INFORMATION**

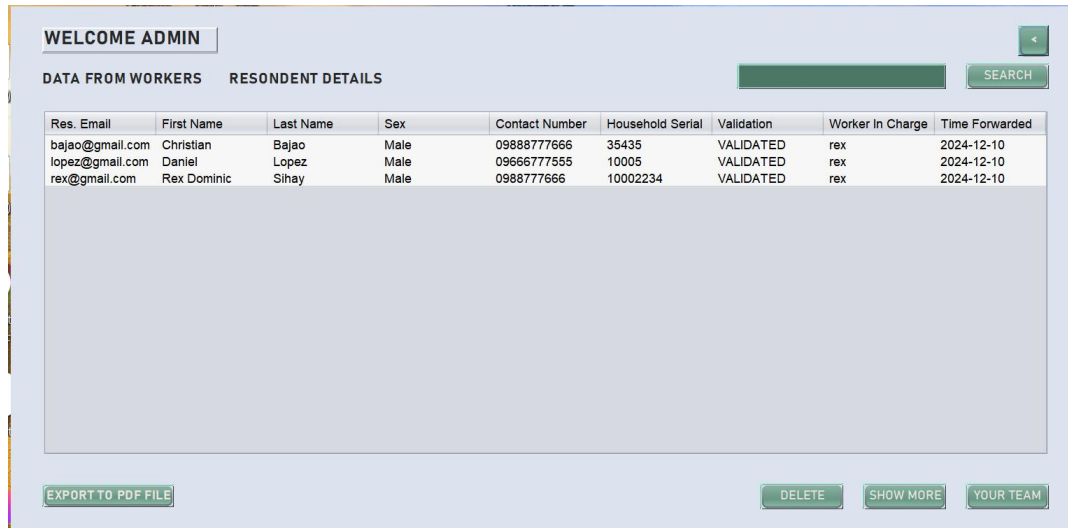
Full Name Waukee	Username waukee	Email waukee@gmail.com	Age 19
Birthdate (mm/dd/yyyy) 09/12/2005	Address San Luis, Gingoog City	Sex Male	
From Cluster 1	Attainment Vocational	Contact No. 09888777666	Status Single

## Window For Showing the Information About the Worker:

Can be accessed by clicking the **“HELLO WORKER”** label in the

## WORKER DASHBOARD.

It displays all of the data of the worker.



The screenshot shows a web interface for an admin. At the top, there's a 'WELCOME ADMIN' label. Below it, there are two tabs: 'DATA FROM WORKERS' and 'RESPONDENT DETAILS'. A search bar with a 'SEARCH' button is on the right. The main area contains a table with the following data:

Res. Email	First Name	Last Name	Sex	Contact Number	Household Serial	Validation	Worker In Charge	Time Forwarded
bajao@gmail.com	Christian	Bajao	Male	09888777666	35435	VALIDATED	rex	2024-12-10
lopez@gmail.com	Daniel	Lopez	Male	09666777555	10005	VALIDATED	rex	2024-12-10
rex@gmail.com	Rex Dominic	Sihay	Male	0988777666	10002234	VALIDATED	rex	2024-12-10

At the bottom, there are buttons for 'EXPORT TO PDF FILE', 'DELETE', 'SHOW MORE', and 'YOUR TEAM'.

### Admin Dashboard:

#### Contains:

A responsive **“WELCOME ADMIN”** label, that will show the details of the admin if clicked.

A **table** the shows all the existing data transferred by the worker to the admin.

#### Buttons:

**“EXPORT TO PDF FILE”**: works only if the admin selects row/rows of data and opens a window where the admin can choose which directory in the desktop to export the selected rows to a file.

**“YOUR TEAM”**: opens a new window that shows all of the workers that the admin handles.

**“DELETE”**: works only if the admin first selects row/rows of data to be deleted and the opens a new small window where the admin can delete information about the chosen respondents.

**“SHOW MORE”**: works only if the admin first selects a row of data in the table and it then opens a small window where the admin can see other details of the respondent.

**“SEARCH BUTTON AND BAR”**: let’s the admin search for an entry they want in the table.



**ADMIN DETAILS**

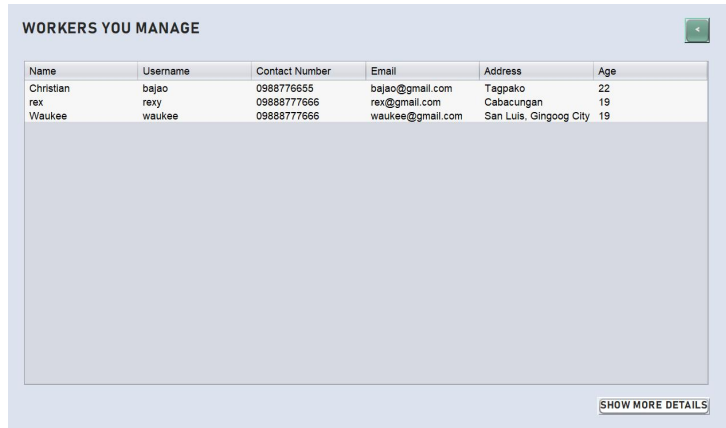
**PERSONAL INFORMATION**

Full Name admin	Username pradmin	Email admin@gmail.com	Age 22
Birthdate (mm/dd/yyyy) 09/12/2002	Address Zone 1, Poblacion, Claveria	Sex Female	
From Cluster 1	Attainment Vocational	Contact No. 09888777665	Status Married

admin.

## Window For Showing the Information About the Admin:

Can be accessed by clicking the **“WELCOME ADMIN”** label in the **ADMIN DASHBOARD**. It displays all of the data of the



**WORKERS YOU MANAGE**

Name	Username	Contact Number	Email	Address	Age
Christian	bajao	0988776655	bajao@gmail.com	Tagpako	22
rex	rex	09888777666	rex@gmail.com	Cabacungan	19
Waukee	waukee	09888777666	waukee@gmail.com	San Luis, Gingoog City	19

[SHOW MORE DETAILS](#)

## Window For Showing the List of Workers that the Admin Handles:

Can be accessed by clicking the **“YOUR TEAM”** button in the **ADMIN DASHBOARD**.

### Contains:

A **table** the shows the list of workers handled by the admin.

### Buttons:

**“SHOW MORE DETAILS”**: works only if the admin first selects a row of data in the table and it then opens a small window where the admin can see other details of the worker chosen in the table.



**ABOUT YOUR WORKER**

**WORKER INFORMATION**


Full Name rex	Username rexy	Email rex@gmail.com	Sex Male
Birthdate (mm/dd/yyyy) 09/13/2005	Contact No. 09888777666	From Cluster 1	Status Widowed
Address Cabacungan	Attainment Vocational	Age 19	

## Window for Showing the Information about the Worker that the Admin handles:

Can be accessed by clicking the **“SHOW MORE DETAILS”** button in the **table** that displays



the workers under the admin.



**RESPONDENT DETAILS**

**PERSONAL INFORMATION**

Last Name Bajao	First Name Christian Abignail	Middle Name Sabaan	Suffix n/a
Birthdate (mm/dd/yyyy) 06/11/2005	Place Of Birth Tagpako, Gingoog City	Age 19	Sex Male
Residence Address Tagpako, Gingoog City	Citizenship Filipino	Status Single	
Email Address bajao@gmail.com	Contact No. 09666555444	Profession Student	Religion Catholic
Educational Attainment College	WORKER IN CHARGE waukee	ENTRY STATUS VALIDATED	

**HOUSING INFORMATION**

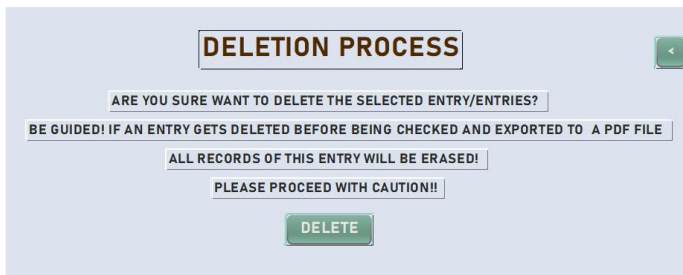
Enumeration Serial Number 1000002	Building Serial Number 12000002	Date Listed 2024-12-10
Household Serial Number 1230000	Housing Unit Serial Number 1200034	Date Forwarded 2024-12-10

### Window For Showing More Info

#### About the Respondent:

Can be accessed by selecting a row in the table and by clicking the “SHOW MORE” button in the **ADMIN DASHBOARD**.

It displays all of the data that matches in the database based on the selected entry in the table.



**DELETION PROCESS**

ARE YOU SURE WANT TO DELETE THE SELECTED ENTRY/ENTRIES?

BE GUIDED! IF AN ENTRY GETS DELETED BEFORE BEING CHECKED AND EXPORTED TO A PDF FILE

ALL RECORDS OF THIS ENTRY WILL BE ERASED!

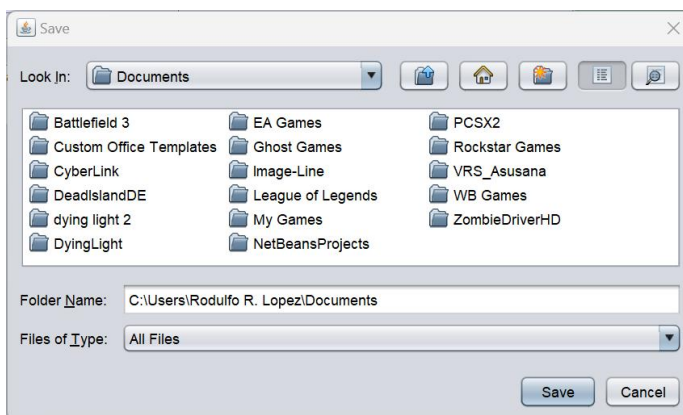
PLEASE PROCEED WITH CAUTION!!

**DELETE**

### Window for the Delete Process:

Can be accessed by selecting row/rows in the table and by clicking the “DELETE” button in the **ADMIN DASHBOARD**.

Prompts the admin if they want to delete all selected data, and by clicking the “DELETE” button on the bottom of the window, the process is done.



Save

Look In: Documents

Battlefield 3	EA Games	PCSX2
Custom Office Templates	Ghost Games	Rockstar Games
CyberLink	Image-Line	VRS_Asusana
DeadIslandDE	League of Legends	WB Games
dying light 2	My Games	ZombieDriverHD
DyingLight	NetBeansProjects	

Folder Name: C:\Users\Rodulfo R. Lopez\Documents

Files of Type: All Files

**Save** **Cancel**

### Window for the Export Process:

Can be accessed by selecting row/rows in the table and by clicking the “EXPORT TO PDF FILE” button in the **ADMIN DASHBOARD**.

Directs the admin to which directory in the desktop the admin

wants to export the selected rows to a file.

## VII. Conclusion

The development of the Data Collection System for Census followed a structured and research-driven approach, adhering to established guidelines and best practices in system design and development. By leveraging the insights gained during the research phase, the system was carefully designed to meet the specific needs of census operations, particularly in regions with limited or no internet access.



The final outcome of the system demonstrates the effectiveness of the adopted approach. It is designed to be robust, reliable, and user-friendly, featuring a seamless offline mode for data entry and comprehensive online functionalities for administrative tasks, including account creation, user management, and data analysis. By following established research guidelines, the system ensures high levels of accuracy and security in managing sensitive census data, making it a dependable tool for census operations.

Rigorous testing and iterative improvements validated the system's performance, usability, and reliability. By adhering to research methodologies and best practices, the system simplifies census processes while ensuring compliance with technical and ethical standards, highlighting the value of systematic guidelines in creating effective solutions.

## **VIII. Recommendation**

**Feedback from the user:** Our team recommends incorporating user feedback into the development process to continuously improve the system's usability and effectiveness.