

# Medicine Management System: Its Design and Development

## **Ruth G. Luciano\***

Nueva Ecija University of Science and Technology/College of Information and Communications Technology,  
Cabanatuan City 3100, Philippines

E-mail: [rcgluciano@gmail.com](mailto:rcgluciano@gmail.com)

ORCID ID: <https://orcid.org/0000-0001-8532-6971>

\*Corresponding Author

## **Rhoel Anthony G. Torres**

Nueodmva Ecija University of Science and Technology/College of Information and Communications Technology,  
Cabanatuan City 3100, Philippines

E-mail: [ragtorres@gmail.com](mailto:ragtorres@gmail.com)

## **Edward B. Gomez**

Nueva Ecija University of Science and Technology/College of Information and Communications Technology,  
Cabanatuan City 3100, Philippines

E-mail: [edwardgomez@gmail.com](mailto:edwardgomez@gmail.com)

## **Hardly Joy D. Nacino**

Nueva Ecija University of Science and Technology/College of Information and Communications Technology,  
Cabanatuan City 3100, Philippines

E-mail: [hardlyjynacino@gmail.com](mailto:hardlyjynacino@gmail.com)

## **Rodmark D. Ramirez**

Nueva Ecija University of Science and Technology/College of Information and Communications Technology,  
Cabanatuan City 3100, Philippines

E-mail: [rdramirez@gmail.com](mailto:rdramirez@gmail.com)

Received: 10 November, 2022; Revised: 27 December, 2022; Accepted: 13 January, 2023; Published: 08 June, 2023

**Abstract:** The researchers conducted this study with the main purpose of helping the residents of the municipality to expedite the process of obtaining free medicine. In the current setup, an individual who needs to avail of free medicine from the barangay or municipal health center personally visits the place to request maintenance medicine. This motivated the researchers to make a research study focusing on converting the manual requisition system to something that people can access quickly and comfortably without necessarily going out of their households, especially during these challenging times – the pandemic. The researchers called it a “Medicine Management System”. The researchers aimed to speed up the requisition of medicine using this online system. The patients or qualified recipients need not consume time lining up to request medicine from the municipal health center. This system can be accessed over the internet anytime and anywhere. Users must register and upload a legit doctor’s prescription. Researchers have created this system using HTML for the system interface, XAMPP for maintaining database records, and PHP for other system functionalities.

**Index Terms:** Health center, free medicine, municipal citizens, xampp

## **1. Introduction and Related Works**

Medicine is a very important thing for the person who needs it, most people say “Prevention is better than cure” but what will happen if you do not have the ability to purchase it? The government has launched a program to support people especially those who are already having their maintenance medicine and who cannot afford or financially support their needs. The fast and efficient distribution of medicine to everyone who needs it is very important. [1]

Similarly, managing medication supply is a challenge for all pharmacies. Scripto (2019) stated that “...an essential part of every successful pharmacy operation, as keeping control of inventory levels has a major impact on bottom-line costs and profit margins. In a highly competitive industry that has seen large increases in supply costs, it’s vital to manage inventory as effectively as possible.” [2]

Inventory management has a vital role in the healthcare industry, especially when people’s lives are at stake. [3] The inventory management software let the end-users know detailed information on medicines batches and stocks.

Overall, it takes care of the inventory, purchases, sales orders, payments, etc. It protects the company from potential damage. Dash (2019) mentioned that inventory management is important for every business type whether a medical company or any medical store. [4]

The above-mentioned system is important not only to medical companies but to health centers as well. The health center is manned by public health workers (nurses, midwives, nutritionists, and doctors) and barangay health workers (BHWs) who work in the process of recording and profiling individuals and families that needs their medical care. In doing medical consultation, BHWs are first on the line to receive personal information from the patient and record them in their forms for proper profiling. Recording of patient consultation is through a manual approach. [5][6]

The purpose of this study is to build a complete, up-to-date, and easily accessible system for the monitoring and recording of medicine disbursement in the research locale. Moreover, the system must be able to generate efficient and accurate reports.

The system offers an assurance that the file will be protected and safe for it will also require authorization before someone can access the system. This is a very important feature that any automated system must have. In the study of Palumbarit and Suarez (2017), they mentioned that a file maintenance system is important in keeping records of the barangay and its residents. [7]

## 2. Methodology

The researchers made use of the developmental research methodology. Ibrahim, as cited by Luciano, et al. (2020) defined this as a product-development process that involves situations in which the is analyzed and described, and the final product is evaluated. [8]

In particular, the researchers made use of the agile methodology in designing and developing the proposed system as shown in Figure 1. It has six stages, namely: requirements identification, design, development, testing, deployment, and review.



Fig. 1. Agile Methodology

The conceptualization of this research started on February 11, 2021. The researchers held an online interview with the Aliaga Municipal Hall Pharmacy Assistant. During the interview, the researchers were able to get important details of the system that they are using and the other requirements that can be integrated with the proposed computerized system.

After identifying all the functional and non-functional requirements of the system, the researchers proceed in designing the different models that they used as bases in the actual development of the system.

The system was developed using the following languages: (1) HTML, a standard markup language used for creating Web pages for this system; (2) PHP, a server-side program for scripting languages in HTML, and (3) Maria DB for the database design.

### 3. Results and Discussion

#### 3.1 Requirements Analysis

For requirements analysis, the researchers conducted a series of interviews. And they found out that the distribution of free medicine to each patient in the town of Aliaga, Nueva Ecija, Philippines is done manually or recorded traditionally using a logbook. This gives the researchers an idea to develop a system that would help improve the current system they have in the research locale.

#### 3.2 Requirements Documentation

The researchers used the following strategies in gathering the data:

##### Interview

An interview is a process whereby the interviewers asked questions and the interviewees provide answers. The figure below shows the online interview conducted by one of the researchers during the data-gathering phase.



Fig. 2. Online Interview with the Respondents

This interview is very helpful in capturing the needs and requirements of the research locale or the research beneficiaries in terms of managing their records. Luciano (2020) said that an interview is used to gather information on people's opinions, thoughts, experiences, and feelings. [9] In order to do this, the proponents first identify the people who can serve as the respondents. These persons were interviewed to get the richest data and information that the proponents needed in designing and developing the system prototype. After the interview, the proponents summarized and analyzed the gathered information and came up with a list of specific features and requirements of the system to be developed.

##### Observation

Observation is a collection approach conducted. It is the acquisition of permanent records that can be used as additional bases in the development. Their personal experiences or the experiences of other people whom they know were also observed and analyzed. Similarly, Herrera and Luciano (2020) mentioned that observation is helpful in determining the specific needs of the target system's beneficiaries. [10]

##### Article Review

Article reviews are published literature or studies. Review articles are a summary of existing literature related to topics covered by researchers. The researchers used them as a basis to find out if there is a similar study being conducted recently. This also provided them with a lot of information that help in improving the features and functionalities of the proposed system.

#### 3.3 Design of Software/Systems

This section shows the design of the Aliaga Medicine Management System prototype. This is a discussion of how each actor interacts with the system process.

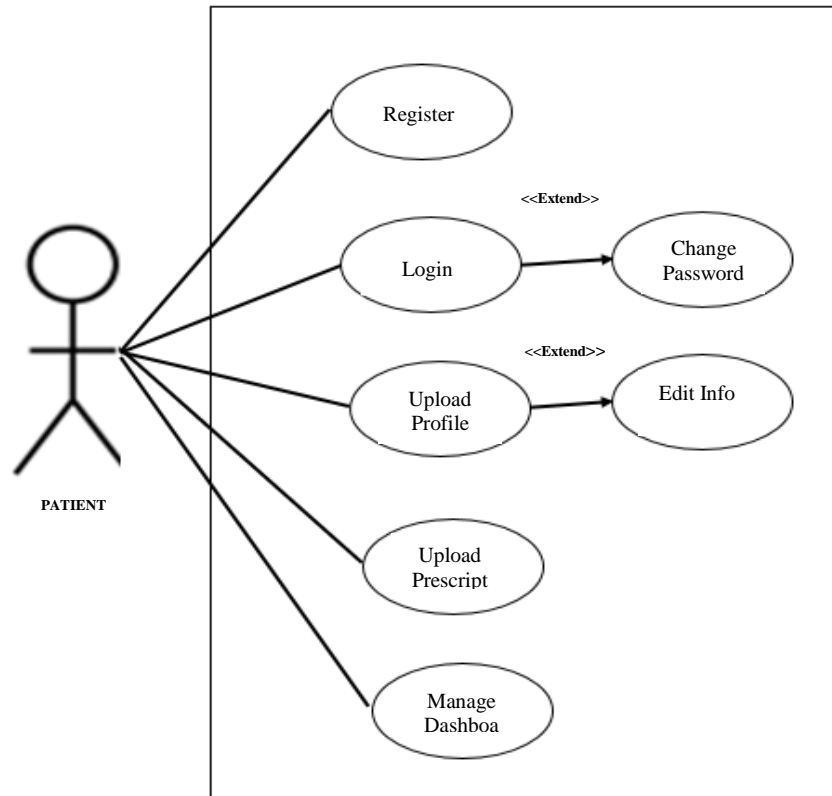


Fig. 3. The System's Use Case Diagram for the Patient

Figure 3 above illustrates an elaborated flow system for the “patient” or the client requesting for medicines. The client/patient can register, log in, change his password, upload a prescription, and log out of his account.

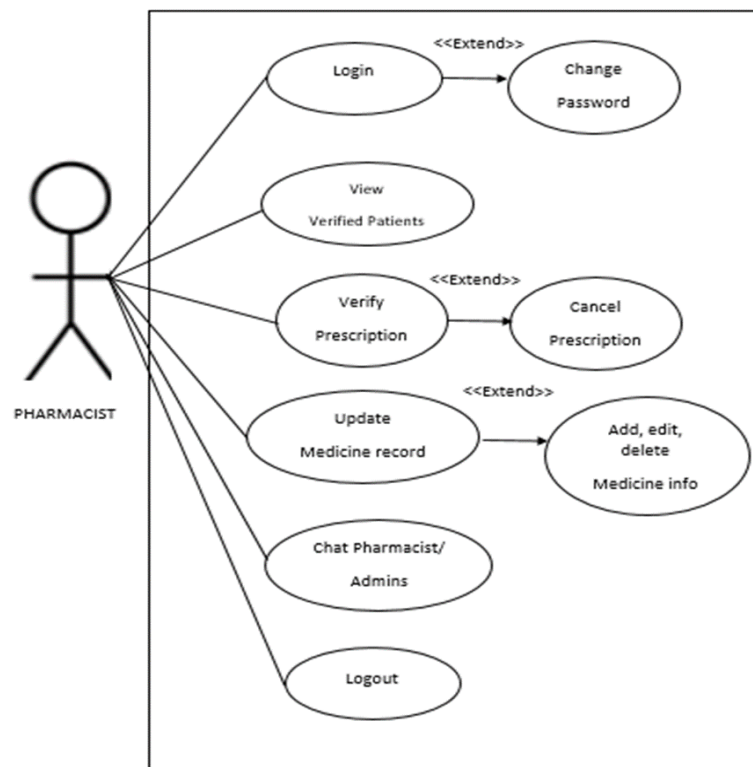


Fig. 4. The System's Use Case Diagram for the Pharmacist

Figure 4 depicts the flow of the pharmacist's module. The pharmacist can log in, change his password, view verified patients by admins, verify and cancel prescriptions, update medicine information, chat with admins and log out of his account.

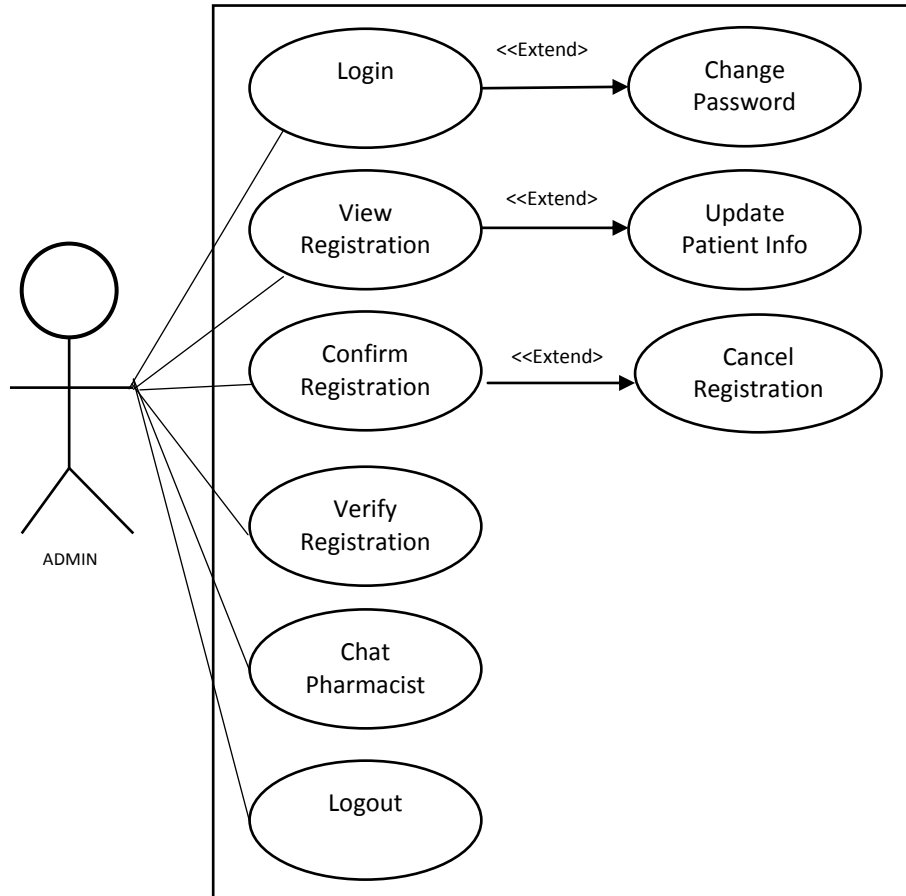


Fig. 5. The System's Use Case Diagram for the Administrator

Figure 5 shown below illustrates an elaborated flow system for the admin. The admin can log in, change password, confirm or cancel patient registration, verify patient registration, edit patient barangay, chat with co-admin and pharmacist, and logout his account.

### 3.4 Development of the System Prototype

The researchers used the following languages in designing and coding the system's prototype:

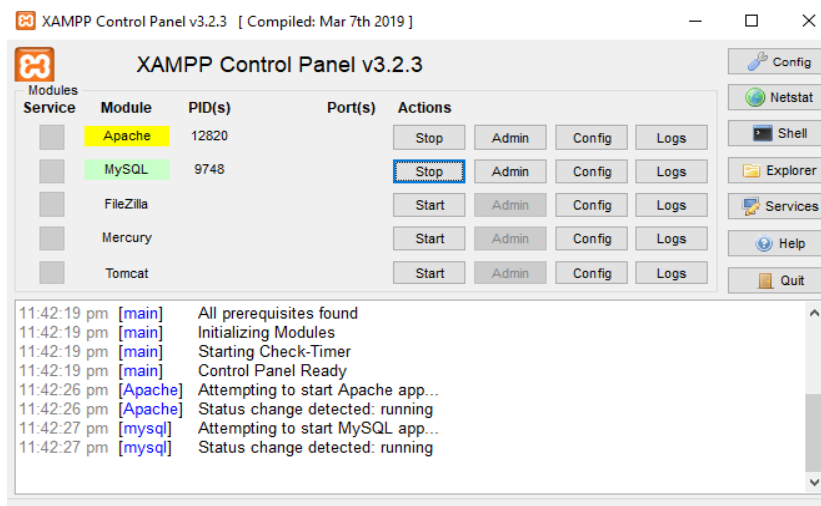


Fig. 6. XAMPP Control Panel

As shown in Figure 6 above the researchers made use of Apache Server and MySQL to establish the connection in the database.

Figure 7, on the other hand, shows the application used by the researchers to set up the database of the system's prototype.

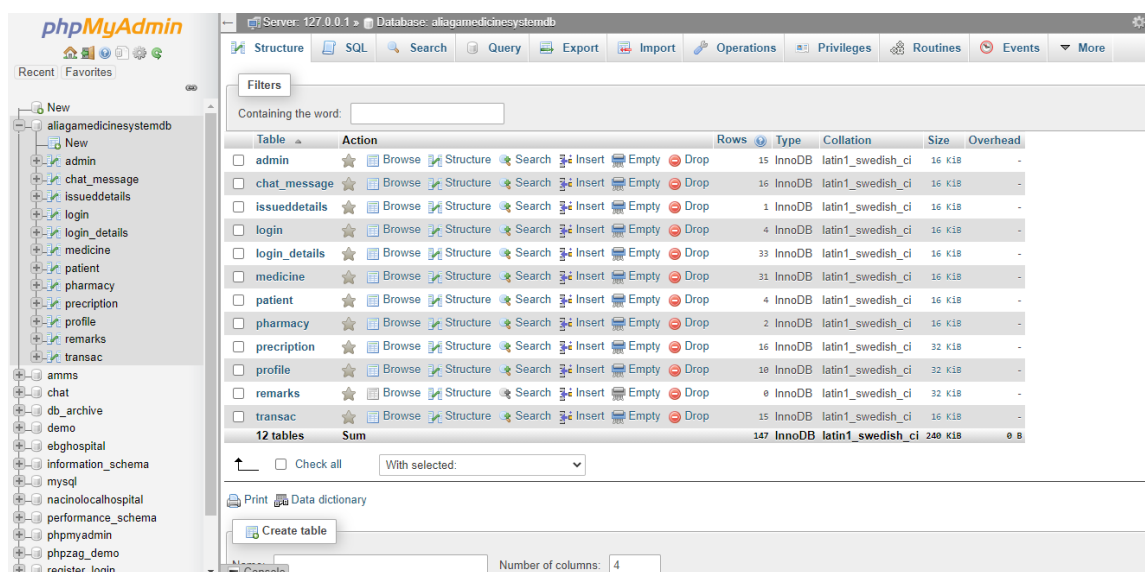


Fig. 7. Screenshot of phpMyAdmin used in creating the system's database

### 3.5 Initial Testing of the System Prototype

Proponents created the prototype to help them picture out the outcome of their project. It can also give them an idea of what can be enhanced and improved based on the results of prototype testing. Researchers have improved the color of the website, added a search bar, and added some icons to make the project even better. The system patient login form is shown in Figure 8 below.



Fig. 8. Patient Log-In Form

## 4. Conclusions

The most important ingredient in making a usable computerized or automated system is to know the real needs and experiences that the end-users have. As regards the computerization of the existing system, the researchers must take into consideration their user experience. This means that the system must be user-friendly, easy to use, portable, and functional.

Finally, the researchers suggest that the following improvements be done to make the Aliaga Medicine Management System more useful and efficient: (1) provide a medicine inventory system, (2) must have a patient record for every single transaction of releasing or taking free medicine from the health center, and (3) continuous upgrade and maintenance of the system must be made so that it will remain relevant and useful to its end-users.

## Acknowledgment

The researchers would like to thank all the people who in one way or another contributed to the completion of this research project.

## Conflict of Interest

The authors declare no conflict of interest.

## References

- [1] Ozawa, Sachiko, et al (2019). Importance of Medicine Quality in Achieving Universal Health Coverage. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0232966>
- [2] Scripto (2019)/ Pharmacy Management: Supply and Demand Medication. [https://www.scriptpro.com/?fbclid=IwAR2Z\\_15td0zKWrCK0TvPLk9tUmPIwZE\\_uTtduoYy\\_Rjiw\\_e6pr2HLHodpQ](https://www.scriptpro.com/?fbclid=IwAR2Z_15td0zKWrCK0TvPLk9tUmPIwZE_uTtduoYy_Rjiw_e6pr2HLHodpQ)
- [3] O'Connor, Stephen (2018). The Importance of Medical Software in Today's Healthcare Practices. <https://www.adsc.com/blog/the-importance-of-medical-software-in-todays-healthcare-practices>
- [4] Dash, S., Shakyawar, S.K., Sharma, M. *et al.* Big data in healthcare: management, analysis, and future prospects. *J Big Data* **6**, 54 (2019). <https://doi.org/10.1186/s40537-019-0217-0>
- [5] Antasuda, Van Barrientos, et. al (2020). Barangay Health Center Management System. [https://www.academia.edu/42224909/BHCMS\\_Barangay\\_Health\\_Center\\_Management\\_System](https://www.academia.edu/42224909/BHCMS_Barangay_Health_Center_Management_System)
- [6] Budiawan, R. and JK Simaniuntak (2019). Inventory Management Application of Drug using FIFO Method. [https://www.researchgate.net/publication/338065504\\_Inventory\\_Management\\_Application\\_of\\_Drug\\_using\\_FIFO\\_Method](https://www.researchgate.net/publication/338065504_Inventory_Management_Application_of_Drug_using_FIFO_Method)
- [7] Palumbarit, J.P., and JK Suarez (2017). Barangay Office Management System. <http://advancejournals.org/International-Journal-of-Mathematics-and-Computing/article/barangay-office-management-system/>
- [8] Herrera NG, Luciano RG. Design and development of android-controlled grass cutting robot using the RPA method. *Int J Sci Technol Res* 2020;9(3):223-234. <https://www.ijstr.org/final-print/mar2020/Design-And-Development-Of-Android-controlled-Grass-Cutting-Robot-Using-Rpa-Method.pdf>
- [9] Luciano, Ruth G. (2020). Design and Development of Human Resource Information System for Private HEIs. *International Journal of Scientific & Technology Research* Volume 9, Issue 03, March 2020 ISSN 2277-8616
- [10] Luciano, R.G., Alcantara, G.M., & Bauat, R. (2020). Design and Development of Alumni Tracking System for Public and Private HEIs. *International Journal of Scientific & Technology Research*, 9, 12-19.

## Authors' Profiles



**Dr. Ruth Garcia Luciano** earned her B.S. in Computer Science and Master of Arts in Education major in Educational Management at the M.V. Gallego Foundation Colleges, Inc., Cabanatuan City in 2001 and 2004, respectively. She finished her Ph.D. major in Education Management at the Nueva Ecija University of Science and Technology in 2008. She is a recipient of the CHED-FDP scholarship which enables her to get her Master of Information Technology degree at the Angeles University Foundation in 2014.



**Prof. Rhoel Anthony G. Torres** is an Associate Professor V at the Nueva Ecija University of Science and Technology, College of Information and Communications Technology. He has been in the teaching profession for more than 15 years now.



**Edward B. Gomez** is an alumnus of the NEUST College of Information and Communications Technology. He graduated with the degree of Bachelor of Science in Information Technology with a specialization in Database Systems Technology in 2020.



**Hardly Joy D. Nacino**, a batch 2020 alumnus of the NEUST-CICT. She took up a BSIT degree specializing in Database Systems Technology.



**Rodmark D. Ramirez** is also an alumnus of the BSIT program at the NEUST College of Information Technology, batch 2020.

**How to cite this paper:** Ruth G. Luciano, Rhoel Anthony G. Torres, Edward B. Gomez, Hardly Joy D. Nacino, Rodmark D. Ramirez, "Medicine Management System: Its Design and Development", International Journal of Education and Management Engineering (IJEME), Vol.13, No.3, pp. 11-18, 2023. DOI:10.5815/ijeme.2023.03.02